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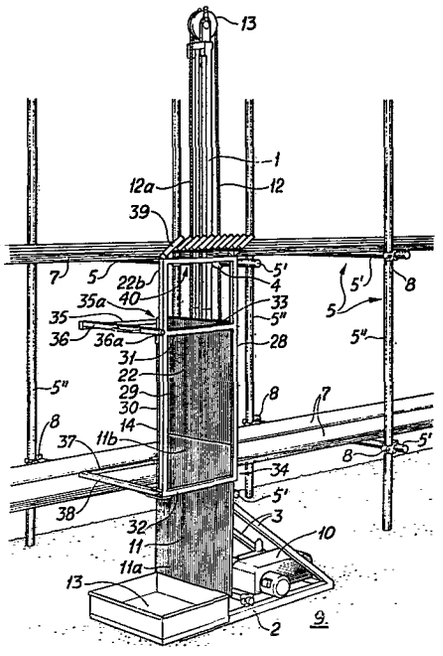
## (54) A device for the transport of material up and down along a guide.

(57) A device for the transport of material up and down along a guide consisting of a base (2) resting on the ground (9) and a guide (1) projecting from the base (2). The device incorporates a power plant (10), which operates in conjunction with the frame (11) via a cable (12) and a guide pulley (13) enabling the frame to be moved up and down along the guide.

The frame (11) has at its lower end (11a) a first set of attachment arrangements intended to operate in conjunction with an attachment arrangement located in the support area (13) for the load and has at its upper end (11b) a second attachment arrangement (14) intended to operate in conjunction with one end of a supporting arm of which the other end carries an attachment arrangement intended for suspended loads. The upper end of the frame also has a third attachment intended to operate in conjunction with an attachment arrangement provided on a component (22) forming an upward extension of the frame. The component of the frame (22) consists of vertical frame elements (28, 29 and 30), horizontal frame elements (31, 32, 33 and 34) and hinged frame elements (35, 36 and 37, 38).

This arrangement makes it possible on the one hand to transport a load supported by the support area (13) and on the other hand to transport a load suspended from an attachment arrangement.

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TITLE OF THE INVENTION: A device for the transport of material up and down along a guide.

## TECHNICAL FIELD.

The present invention relates to a device intended to permit the transport of material up and down along a guide, said device consisting of a frame operated by a power plant together with bearing devices between the frame and the guide.

## DESCRIPTION OF THE PRIOR ART.

Previously disclosed are various passenger lifts permitting the transport of persons up and down along a guide, said passenger lifts being subject to stringent safety regulations.

Also previously disclosed is the use of a crane to permit the transport of material up and down to a workplace situated within a building site.

## DESCRIPTION OF THE PRESENT INVENTION.

### TECHNICAL PROBLEM.

A problem is frequently encountered in conjunction with the design of a device for transporting the pipes and planks required for the erection of scaffolding. It is usual for scaffolding, which consists of vertical pipes and horizontal connecting pipes, to be erected without the help of a hoist.

Once the scaffolding is safely in position, it is not unusual to install a special passenger lift which is covered by the appropriate regulations, and at the same time to use a crane to raise building materials to the floor on which the workplace is situated and on which the material is to be used.

Consequently, a major problem is associated with the pronounced desire to produce a transport device of such a kind that it may be used both during the erection and dismantling of the scaffolding and for the transport of materials, preferably building materials, up and down during the construction work.

### SOLUTION

The present invention relates to a device intended for the transport of material up and down along a guide of such a nature that it has succeeded in solving the problems referred to above, said device consisting of a frame operated by a power plant together with bearing devices or bearing surfaces between the frame and the guide.

In order to offer the possibility on the one hand of using the device for the transport of pipes and planks for use in the scaffolding, and on the other hand of using the device for the transport of materials up and

down, the present invention proposes that the frame shall exhibit at its lower end a first set of attachment arrangements intended to operate in conjunction with an attachment arrangement located in a support area for the load, and at its upper end a second set of attachment arrangements intended to operate in conjunction with one end of a supporting arm of which the other end carries an attachment arrangement intended for suspended loads.

The present invention proposes that the first attachment arrangement may be in the form of holes passing through a hollow metal section, with sockets (of hollow metal section) located in the support area also having holes, said sockets being so dimensioned as to fit inside or over the hollow metal section on the frame, and that a pin may be inserted through both the holes in the hollow metal section and the holes in the sockets.

The second attachment arrangement is in the form of a U-shaped groove with a hole extending vertically so that one end of the arm may be inserted into the U-shaped groove, said hole being fitted with a pin which acts as a shaft enabling the arm to pivot.

The attachment arrangement for suspended loads is in the form of a load hook, preferably attached to the other end of the arm so that it is free to rotate.

The upper end of the frame also has a third attachment arrangement intended to operate in conjunction with an attachment arrangement provided on a component forming an upward extension of the frame.

The attachment arrangements formed on the component of the frame consist of holes through a length of hollow metal section, with sockets which form part of the component of the frame so dimensioned as to fit inside or over the length of hollow metal section on the frame and also provided with holes, and with a pin capable of being inserted through the holes.

The component of the frame is in the form of a

frame with elements which may be folded up and down, and a control organ which is free to rotate is attached to the upper end of the component of the frame and is intended when folded down to serve mainly as a support for pipes and when folded up to permit the transport of planks resting against the support area.

## TECHNICAL ADVANTAGES.

The principal technical advantages which may be regarded as being associated with a device in accordance with the present invention are that the device has been designed in such a way that it may be converted by simple means from being used for the transport of material up and down along a guide resting on a support area to a device enabling the transport of material up and down suspended from an attachment arrangement.

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What may be regarded as the characteristic feature of a device for the transport of material up and down along a guide in accordance with the present invention is indicated in the first characterizing section of the following Patent Claim.

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## DESCRIPTION OF THE DRAWINGS.

A preferred embodiment exhibiting the characteristic features of the present invention will now be described in greater detail with reference to the attached drawing, in which

Fig. 1. shows a perspective view of a device intended

for the transport of material up and down along a guide;

Fig. 2 shows the device during loading of scaffolding pipes;

Fig. 3 shows the device prior to the transport of scaffolding planks;

Fig. 4 shows the device being used to transport material in the form of bricks suspended from an attachment arrangement;

Fig. 5 shows the device with a suspended load in the form of a wheelbarrow filled with mortar;

Fig. 6 shows the range of adjustment of the supporting arm in the form of dotted lines;

Fig. 7 shows a section through a guide profile;

Fig. 8 shows an exploded view of the first attachment arrangement;

Fig. 9 shows an exploded view of the second and third attachment arrangements.

## DESCRIPTION OF THE PREFERRED EMBODIMENT.

Fig. 1 shows a device intended for the transport of material up and down along a guide. The device consists of said guides 1 rigidly attached to a base plate 2 and secured partly by stays 3 and partly by clamps 4 attached to horizontal pipes 5' forming part of a scaffolding 5 with vertical pipes 5" and with planks 7 arranged between the pipes 5' . The pipes 5' and 5" are attached to each other by means of clamps 8 .

The base 2 rests on the ground 9 , as does the scaffolding 5 .

The guide 1 may best consist of a number of interconnected component parts enabling the guide 1 to be erected upwards or dismantled easily, depending on whether the height of the scaffolding is to be increased or decreased.

The device intended for the transport of material up and down along a guide consists of a frame 11 operated by a power plant 10 , of which the displacement is controlled by a cable 12 which runs from the power plant 10 upwards and over a guide pulley 13 and then downwards, as shown by the reference designation 12a , with the end of the cable which is not shown being attached to the upper part 11b of the frame 11 .

The frame 11 has at its lower end 11a a first attachment arrangement 130 as illustrated in Fig. 8 intended to operate in conjunction with an attachment arrangement 131 located in a support area 13 for a load.

At its upper end 11b is a second attachment arrangement 14 as illustrated in Fig. 9 intended to operate in conjunction with one end of a supporting arm 15 , shown in Fig. 6, of which the other end carries an attachment arrangement 16 intended for suspended loads.

Fig. 8 indicates that the first attachment arrangement 130 consists of two holes 132 , each of which passes through a hollow metal section 17 attached to the frame 11 , and two holes 131 in two hollow sections 18 , said hollow metal sections being dimensioned so as to fit either inside or over each other, together with two pins, each pin 19 being capable of being inserted through both the hole 131 in the hollow metal section 18 and the hole 132 in the section 17 .

The support area 13 is fitted with upward-facing sides with the reference designations 13a , 13b and 13c.

The second attachment arrangement 14 , shown in Fig. 9, consists of a U-shaped groove 14a with a hole 14b which extends vertically, and one end 15a of the arm 15 which is also provided with a hole may be inserted into the U-shaped groove 14a . A pin 20 passes through all the holes and acts as a shaft enabling the arm 15 to pivot. (The attachment of the arm is not shown in Fig. 9).

The attachment arrangement intended for suspended loads consists of a load hook 16 , preferably attached to the other end 15b of the arm so that it is free to rotate. The pivoting shaft formed by the pin 20 enables the arm 15 to move to a variety of positions, with the solid arm shown in Fig. 6 illustrating the position used for the transport of material up and down along the guide 1 , whilst the arms shown with dotted lines in Fig. 6 illustrate the manner in which the load may be swung over so that it may be lowered onto planks 7 forming part of the scaffolding.

The upper end 11b of the frame also has a third attachment arrangement 21 intended to operate in conjunction with two attachment arrangements 23 formed on a component 22 forming an upward extension of the frame.

The attachment arrangements 23 provided on the component of the frame 22 consist of two holes, each of which passes through one of the hollow metal sections 24 , with sockets forming part of the component of the frame being so dimensioned as to fit either inside or over lengths of hollow metal section 25 on the upper end 11b of the frame. Each length of hollow metal section 25 is provided with a hole 26 , and a pin 27 may be inserted into the holes 26 , 23 which operate in conjunction with each other.

The component of the frame 22 , as may be seen from Fig. 1, consists of a frame with three vertical elements 28 , 29 and 30 and with horizontal elements 31 , 32 , 33 and 34 . One frame element 35 is attached to the element 30 at point 35a in such a way that it is free to move and is provided with a locking arrangement so that it may adopt the position indicated in Fig. 1. One frame element 36 is attached to the element 29 at point 36a in such a way that it is free to move and is so arranged that it may be locked in the position shown

in Fig. 1. The same is true of frame elements 37 and 38. Frame elements 35, 36, 37 and 38 may be moved into a folded-up position.

Fig. 2 shows how the frame elements 36 and 38 have been moved to the folded-up position, thereby opening the component of the frame enabling a number of pipes 5" to rest against the support area 13, and how they are held in position by a control organ 39 attached to the upper end 22b of the component of the frame 22 so that it is free to move. The position of the control organ 39 in Fig. 2 shows that the pipes 5" may simply be positioned parallel to each other. The control organ is free to move and is able to adopt the position shown in Fig. 1 or the position shown in Fig. 2.

Fig. 3 illustrates how the control organ 39 is able to adopt an outward-facing position (similar to Fig. 1), enabling the planks 7 to be loaded and to rest against the support area 13 and a frame element 40, at the same time as the frame elements 38 and 36 are in a folded-up position.

Fig. 4 shows that the support area 13 has been removed from the lowest part of the frame and that the component of the frame 22 has been removed from the upper part 11b of the frame 11 and that a supporting arm 15 has been attached to the second attachment arrangement 14. Fig. 4 shows a number of bricks 42 loaded on a trolley 41 suspended from the load hook 16, representing a load suspended from the attachment arrangement 16.

Fig. 5 shows a wheelbarrow 43 filled with mortar representing a load suspended from the load hook 16.

It should be noted that once the wheelbarrow 43 has been raised by the device to a height level with the person 44, the arm 15 may be pivoted about one of its ends 15a and about the pivoting shaft 20, enabling

the wheelbarrow 43 to be swung across and positioned directly over the planks 7 supporting the person 44 .

Fig. 7 shows a section through a guide profile, from which section it may be seen that the dimensions of the flat surfaces should be 50 mm in a preferred embodiment. The space 45 is intended for clamps or securing devices 4 between the guide 1 and the pipes 5' , whilst the channels 45a and 45b are intended to accommodate connecting unions between two adjacent guide elements. The space 45c may also serve as a guide track and bearing surface for the frame 11 as this is displaced up and down along the guide.

The present invention is not, of course, restricted to the preferred embodiment indicated above by way of an example, but may undergo modifications within the scope of the following Patent Claims.

## PATENT CLAIMS

1. A device intended for the transport of material up and down along a guide (1) consisting of a frame (11) operated by a power plant (10) together with bearing devices between the frame and the guide, c h a r a c t e r i z e d in that the frame (11) has at its lower end (11a) a first set of attachment arrangements (132) intended to operate in conjunction with an attachment arrangement (131) located in a support area (13) for the load and at its upper end (11b) a second attachment arrangement (14) intended to operate in conjunction with one end (15a) of a supporting arm (15) of which the other end carries an attachment arrangement (16) intended for suspended loads.

2. A device in accordance with Patent Claim 1, c h a r a c t e r i z e d in that the first attachment device (130) is in the form of holes (132) passing through a hollow metal section (17) and similarly formed holes (131) in sockets (of hollow metal section) located in the support area (13) and in that a pin (19) may be inserted through both holes (132 , 131).

3. A device in accordance with Patent Claims 1 and 2, c h a r a c t e r i z e d in that the support area (13) is provided with upward-facing sides (13a , 13b , 13c).

4. A device in accordance with Patent Claim 1, c h a r a c t e r i z e d in that the second attachment arrangement (14) is in the form of a U-shaped groove (14a) with a hole (14b) which extends vertically and in that one end (15a) of the arm may be inserted into the U-shaped groove and is provided with a hole fitted with a pin (20) which acts as a shaft enabling the arm (15) to pivot.

5. A device in accordance with Patent Claim 1, c h a r a c t e r i z e d in that the attachment

arrangement (16) for suspended loads is in the form of a load hook, preferably attached to the other end (15b) of the arm so that it is free to rotate.

6. A device in accordance with Patent Claim 1, c h a r a c t e r i z e d in that the upper end of the frame also has a third attachment arrangement (21) intended to operate in conjunction with an attachment arrangement (23) provided on a component (22) forming an upward extension of the frame.

7. A device in accordance with Patent Claim 6, c h a r a c t e r i z e d in that the attachment arrangement (23) formed on the component (22) of the frame consists of a hole through a length of hollow metal section in which the part attached to the frame is so dimensioned as to fit inside or over a length of hollow metal section on the frame (11b) which is also provided with holes (26) and in which a pin (27) may be inserted through the holes (26 , 23).

8. A device in accordance with Patent Claim 6, c h a r a c t e r i z e d in that the component (22) of the frame is in the form of a frame (28 , 29 , 30) with elements (35 , 36 , 37 , 38) which may be folded up and down.

9. A device in accordance with Patent Claim 6, c h a r a c t e r i z e d in that a control organ (39) which is free to rotate is attached to the upper end of the component (22) of the frame.

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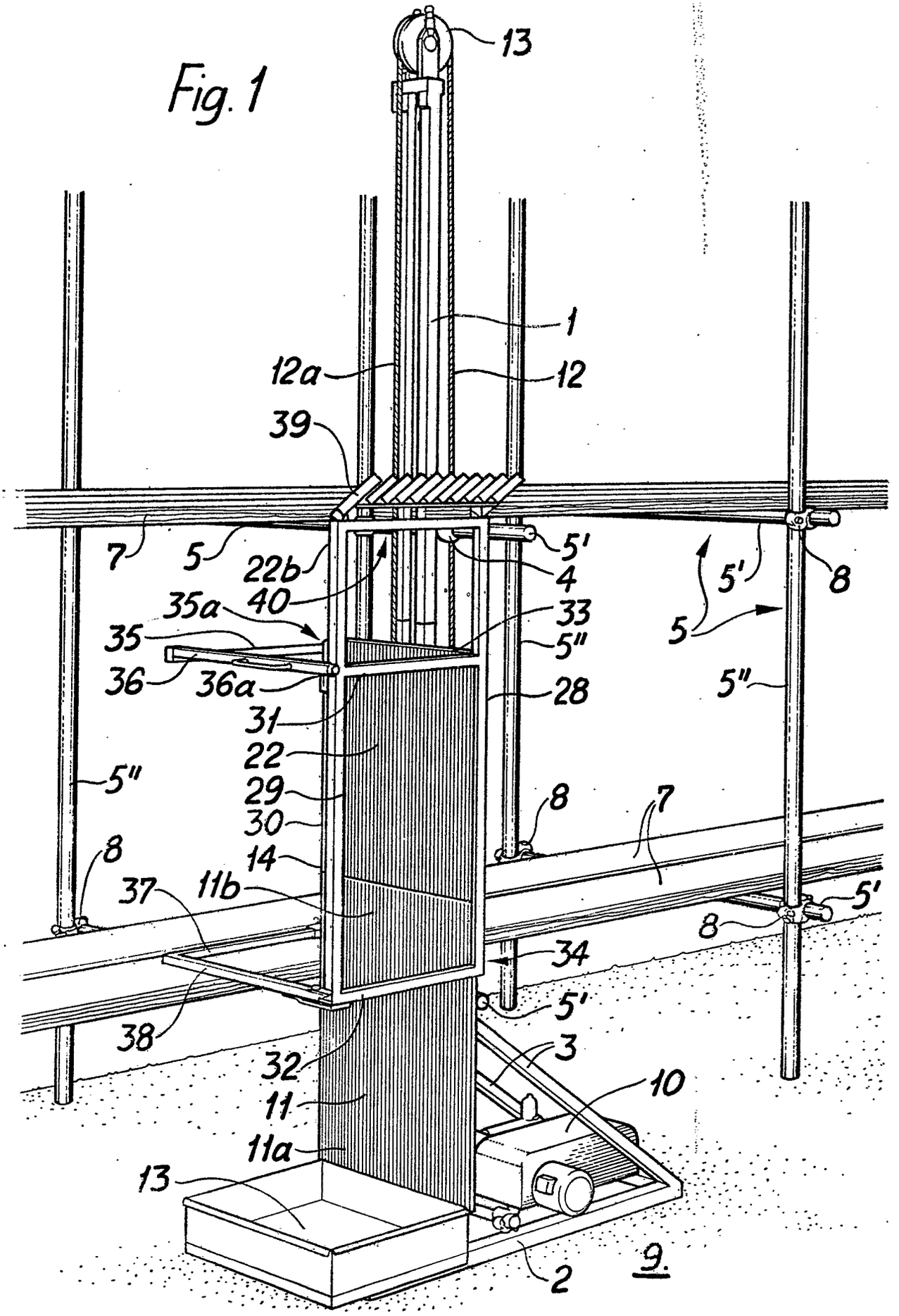
Fig. 1



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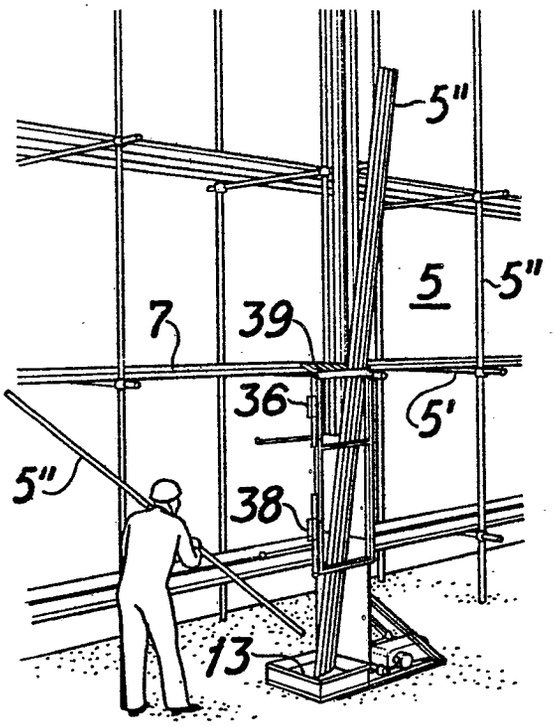


Fig. 2

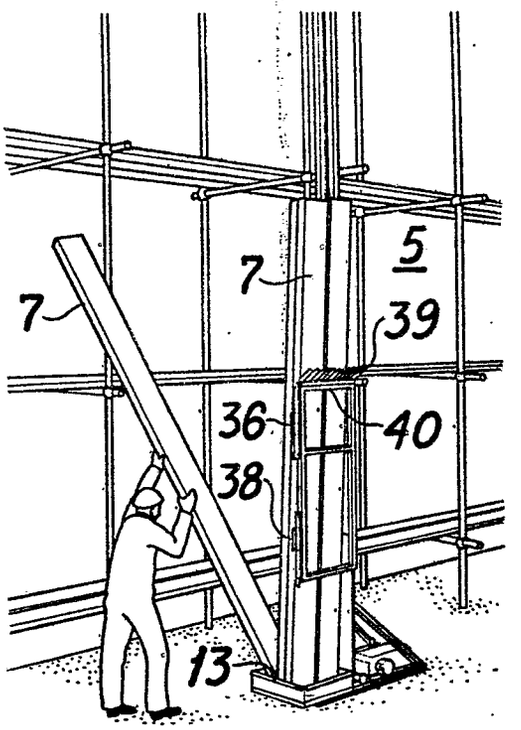


Fig. 3

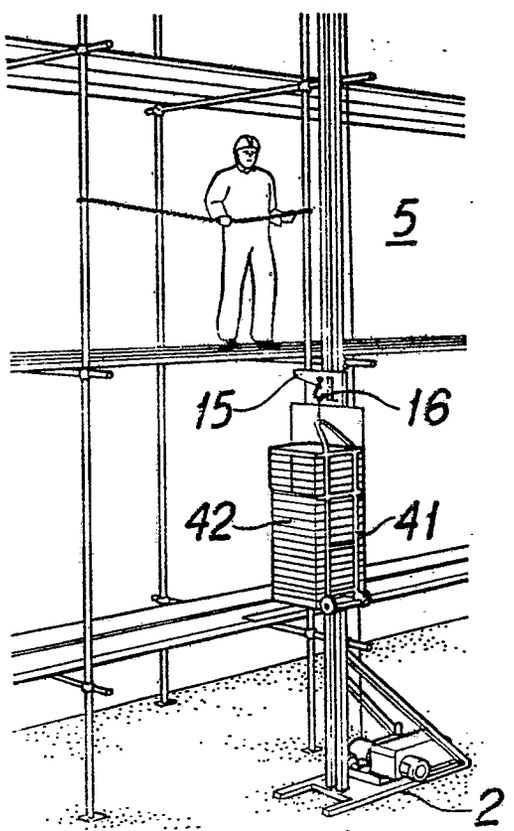


Fig. 4

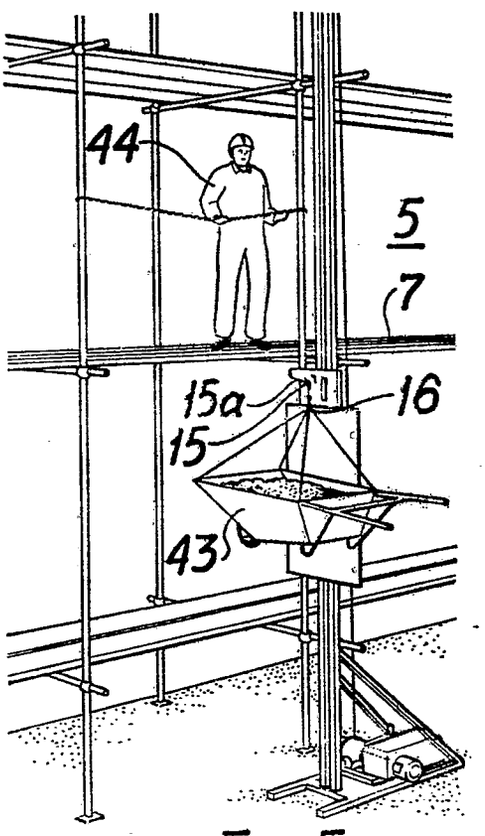


Fig. 5

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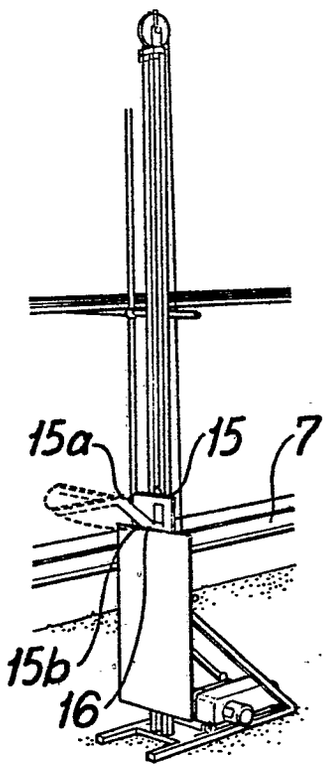


Fig. 6

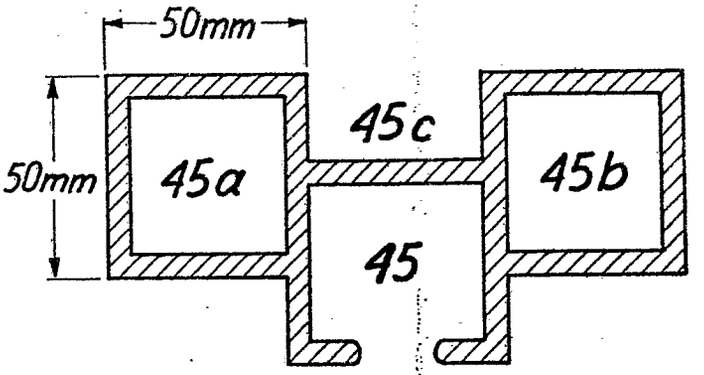


Fig. 7

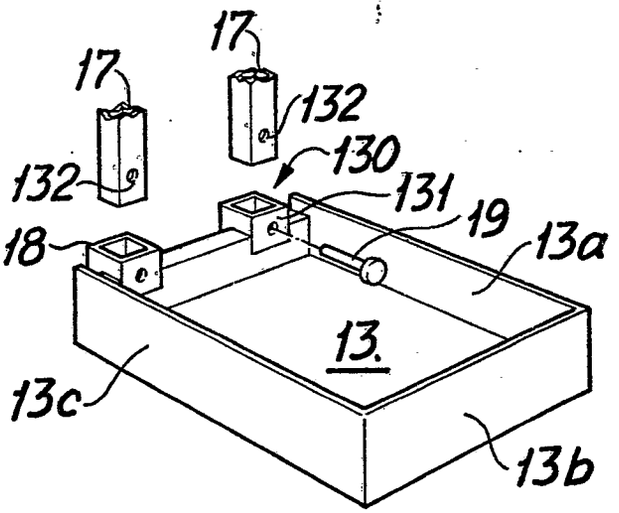


Fig. 8

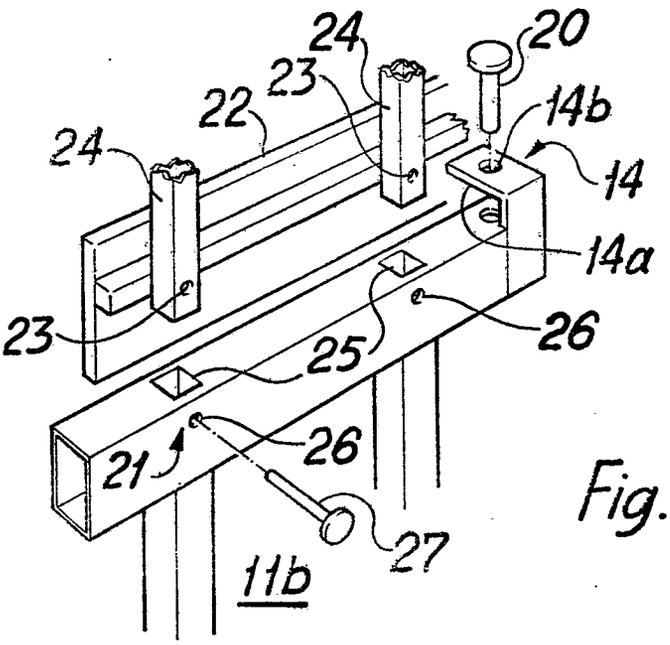


Fig. 9

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Application number

EP 81 85 0171.0

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# EUROPEAN SEARCH REPORT

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.³) |
|---|---|---|---|
| | DE - U - 6 932 305 (W. LAYHER)<br>* whole document * | 1 | B 66 B 9/18<br>E 04 G 21/00 |
| | US - A - 1 045 301 (C.J. LAWLESS)<br>* fig. 6 * | 3 | |
| | DE - U - 7 112 586 (MÜLLER & BORGGRÄFE KG)<br>* whole document * | 6,8,9 | |
| | CH - A - 104 631 (E. BENNINGHOVEN)<br>* whole document * | 1,5 | TECHNICAL FIELDS SEARCHED (Int. Cl.³)<br>B 66 B 9/00<br>B 66 B 11/00<br>E 04 G 21/00 |
| A | DE - U - 1 804 091 (A. BÖCKER)<br>* whole document * | | |
| A | DE - C - 267 489 (C. SCHLÖSSER)<br>* whole document * | | |

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
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E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

X The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| Berlin | 23-12-1981 | KRABEL |