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(54) **Underground equipment handling arrangement**

(57) A device for raising and lowering an equipment housing (1) into a pit includes a set of ramps (6,7) preferably built into the sides of a pre-cast pit housing. The equipment housing (1) is fitted with wheels (4,5) to engage the ramps (6,7). A winch mounting (8) is provided near the top end of the ramps, and a winch (9) is

removably mounted in mounting (8), the winch being attached to housing (1) by cable (10), whereby the housing can be safely raised and lowered.

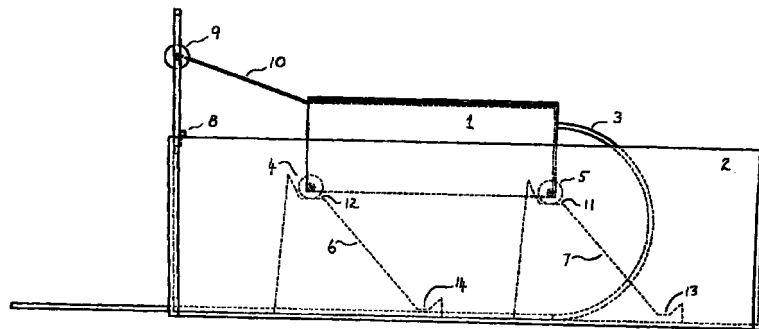


Fig 1

Description

Figure 4 shows a further embodiment of the invention.

Specification

[0001] The following statement is a full description of this invention, including the best method of performing it known to us:

Technical Field

[0002] This invention relates to an arrangement for raising and lowering heavy articles and will be described with reference to installations for electronic equipment in below ground pits.

Background Art

[0003] At present heavy equipment housings are installed in and removed from pits by the use of a crane. This is a labour intensive process, requiring a technician to provide access to the pit, which is usually locked by the telecom carrier, and a crane driver. Time is also wasted in co-ordinating the arrival of the crane at the installation.

Disclosure of the Invention

[0004] A first embodiment of the invention includes ramp means permanently or temporarily installed in the pit and arranged so the equipment housing may be raised or lowered along the ramp means.

[0005] In one embodiment, the equipment housing interacts with a wheeled or rolling mechanism affixed to the housing or the ramp means.

[0006] In a second embodiment the housing slides up or down the ramp.

[0007] In a preferred embodiment the ramp means includes a pair of substantially parallel inclined ramps attached to opposite side walls of the pit.

[0008] In a further embodiment, a winch mounting is included in the end wall of the pit at the top end of the ramp means.

Brief Description of the Drawings

[0009] The invention will be described with reference to the accompanying drawings in which:

Figure 1 is a side view illustrating an embodiment of the invention;

Figure 2 is an "X-ray" perspective showing the equipment housing in the lowered position in the pit.

Figure 3 shows an alternative embodiment of the invention.

Best mode of carrying out the Invention

[0010] Figure 1 shows an arrangement for facilitating access to equipment contained in housing 1 which is installed in a pit 2. The housing is shown in the raised position.

10 [0011] The equipment housing 1 is fitted with a first pair of wheels, 5, at the front end, and a second pair of wheels at the rear end. Wheel 5 rests on a plateau 11 at the top of ramp 7, and wheel and rests on plateau 12 at the top of ramp 6. A backstop on each plateau prevents the housing rolling off one side of the plateau.

15 [0012] The housing 1 is held on the plateaus by cable 10 attached to winch 9 which is mounted in or adjacent to the pit 2 at mounting points.

20 [0013] In this raised position the housing may be opened to enable a technician to access the equipment inside the housing.

[0014] As better shown in Figure 2, the pair of wheels 4 co-operate with a pair of ramps 6 attached to opposite side walls of the pit 1, and similarly the pair of wheels 5 co-operate with a corresponding pair of ramps 7.

25 [0015] In Figure 2, housing 1 is shown in the lowered position. In this position, the winch 9 and cable 10 can be detached and a lid placed over the pit and optionally locked in position.

[0016] Figures 1 & 2 illustrate how the housing 1 can be raised and lowered in the pit by the use of the ramps 6 & 7. Preferably a winch 9 is used to raise and lower the housing 1.

[0017] The housing 1 may be connected to one or more communication cables, 3, having sufficient flexibility to permit the raising and lowering of the housing 1.

[0018] In a preferred embodiment, the pit is made of precast material, such as concrete or fibreglass, and the ramps 6 & 7 are moulded into the side walls. Optionally, metal strips may line the ramps and plateaus to provide a stronger contact surface. Alternatively, the ramps 6 & 7 may be portable and inserted into the pit when it is necessary to raise the housing 1. Instead of wheels, angled skids parallel to the angle of the ramps may be affixed to the sides of the housing 1. In a development of this embodiment, the ramp may be substituted by an inclined wheeled or roller arrangement.

45 [0019] Figure 3 shows sets of wheels or rollers 36, 37 fixed in an inclined plane and corresponding ramps 34, 35 affixed to the equipment care.

[0020] The lower ends of the ramps include horizontal regions 38, 39 to provide stability when the housing is raised. The upper ends of the ramps are tapered (310, 311) to ensure smooth engagement with the wheels or rollers.

55 [0021] This configuration may be suitable where the inclined sets of wheels are carried by the technician, as

this eliminates the need to affix wheels to all the housings. The portable wheels also include abutment means (not shown) to retain the sets of wheels in place while under load by preventing longitudinal or transverse movement.

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[0022] Figure 4 shows an embodiment using only one pair of ramps 47 co-operating with a single pair of wheels or skids 45 affixed to the housing. An additional ledge 49 is provided to support the housing in the raised position.

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Claims

1. An equipment handling arrangement for raising or lowering an equipment case, including: 15
 - an inclined transport mechanism including inclined ramp means and co-operating engagement means to provide sliding or rolling engagement with the ramp means, and traction means to raise or lower the equipment case via the inclined ramp means. 20
2. An arrangement as claimed in claim 1 wherein the ramp means includes at least two ramps installed in a recess and wherein the engagement means includes a corresponding number of wheels or skids attached to the case, each wheel or skid co-operating with an associated one of the ramps. 25

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3. An arrangement as claimed in claim 2 including four parallel ramp means installed in the recess and four wheels attached at or near the corners of a box shaped case. 35
4. An arrangement as claimed in claim 1 including at least two parallel ramps attached to the case and a corresponding number of sets of wheels or skids installed in a recess, each set of wheels or skids being in linear alignment, the sets of wheels or skids being parallel and substantially parallel to the ramps on the case in the horizontal position. 40
5. An arrangement as claimed in claim 1 wherein the ramp means includes a first set of four parallel ramps installed in a recess and wherein the engagement means includes a second set of four parallel ramps attached to the case. 45
6. An arrangement as claimed in any one of claims 1 to 5 wherein the traction means includes a winch installed higher than the case in its raised position. 50
7. An arrangement for handling an object substantially as herein described with reference to the accompanying drawings. 55

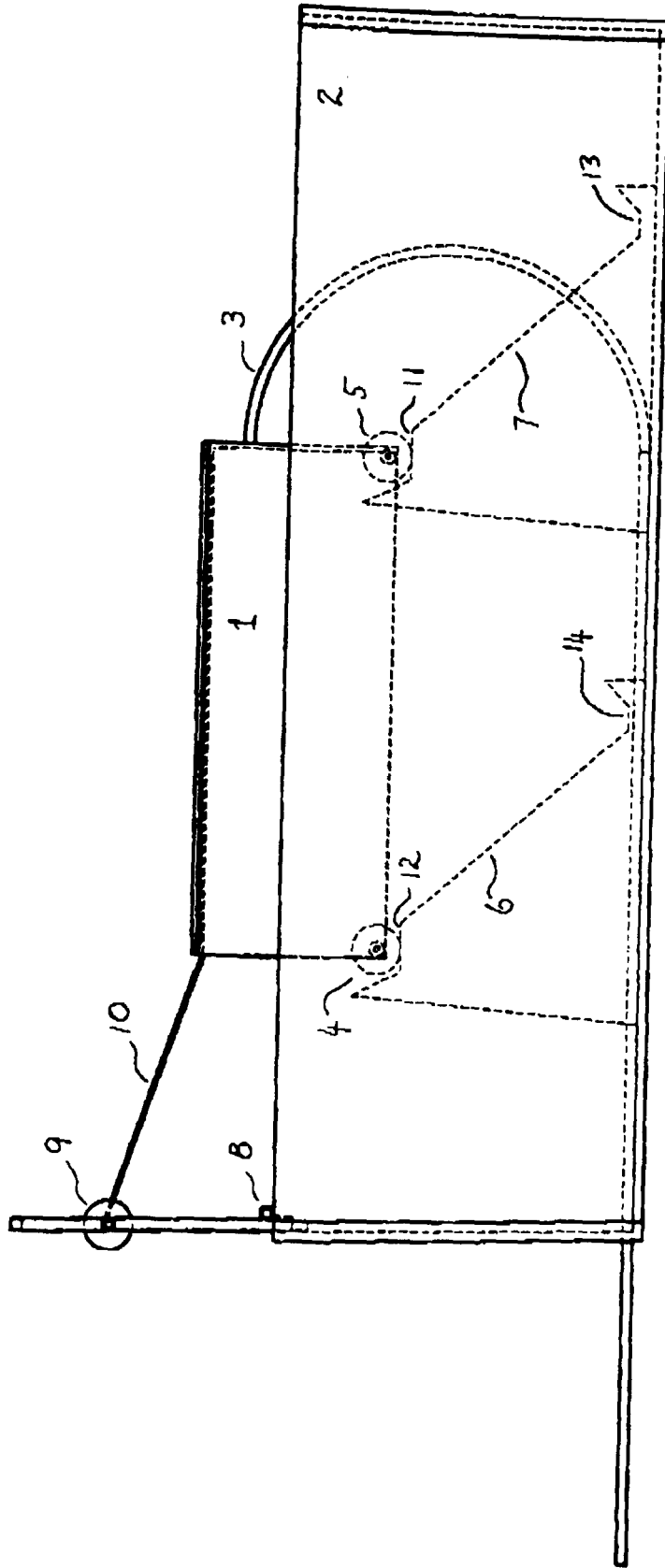
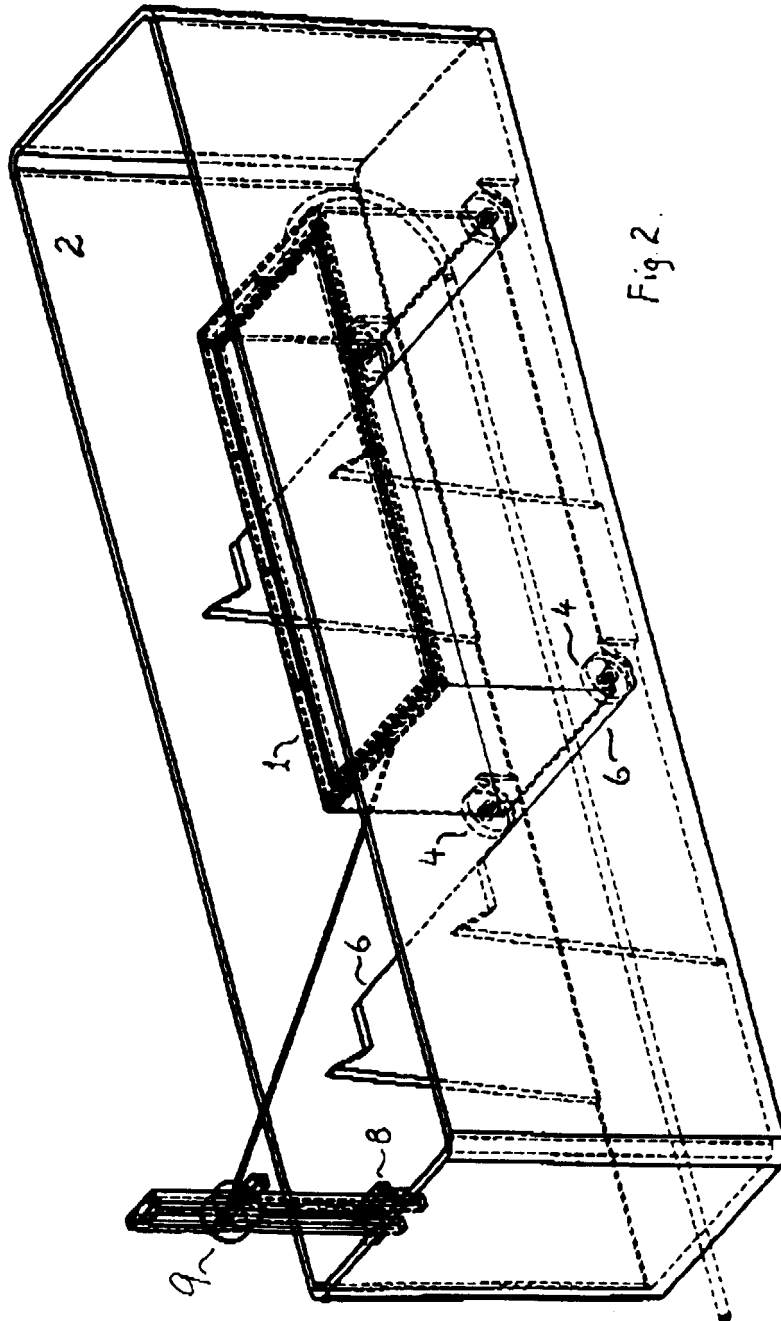


Fig 1



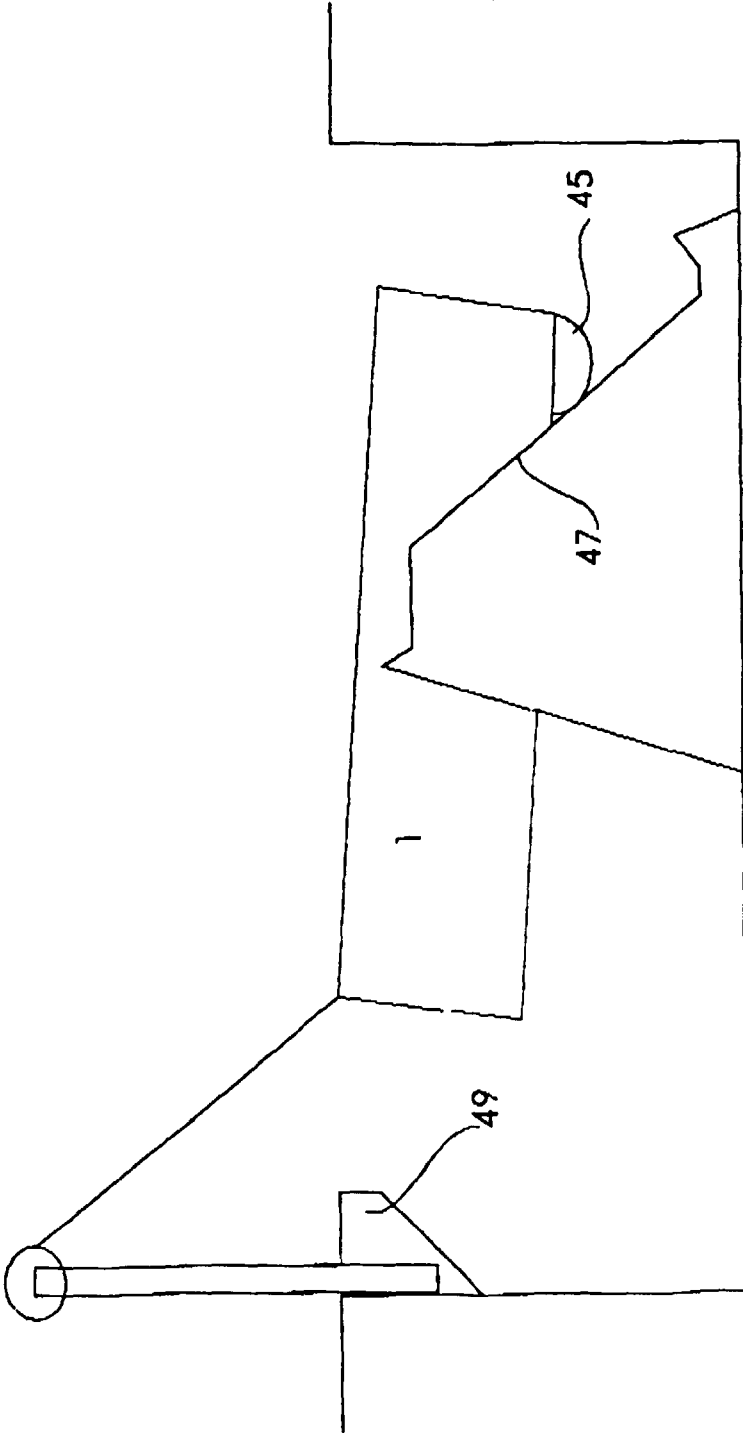


FIGURE 4

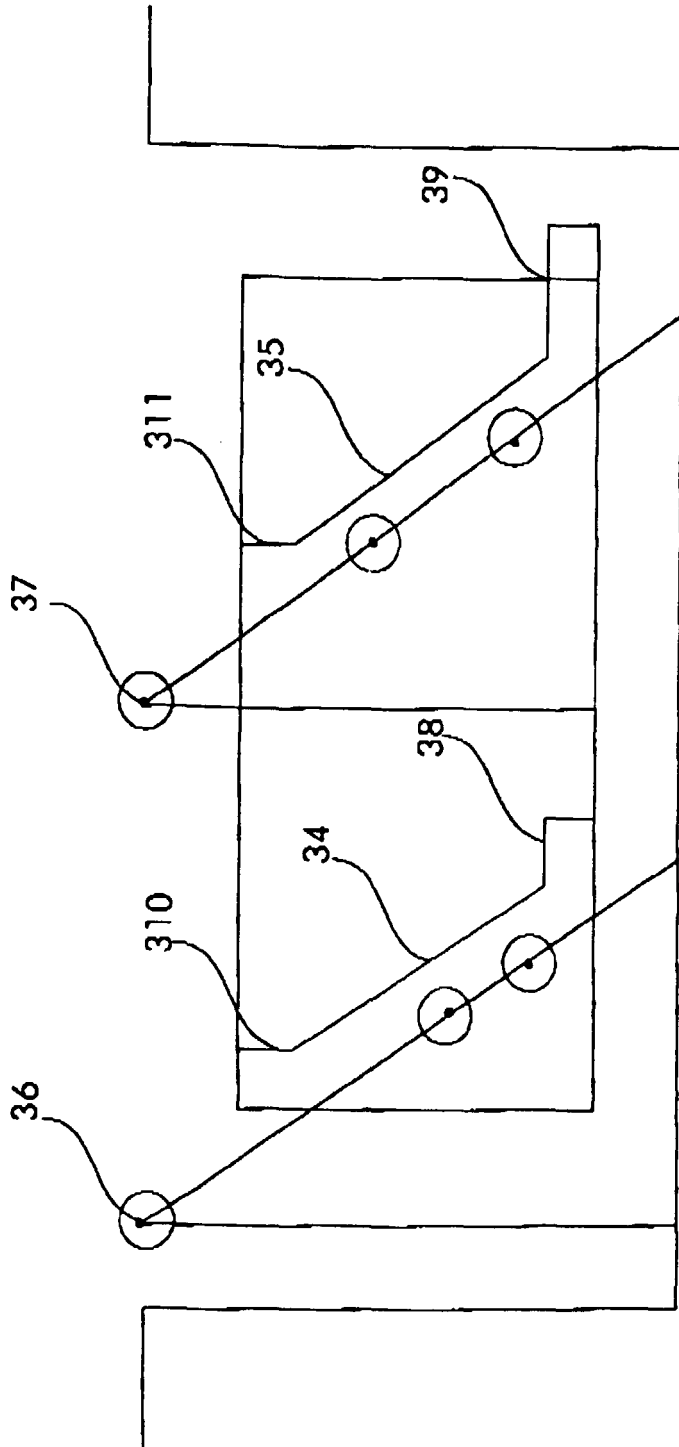


FIGURE 3



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 11 9168

| 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.7) |
| X | US 2 224 529 A (THOMPSON) 10 December 1940 (1940-12-10) | 1-4, 6, 7 | B66F7/24 |
| Y | * the whole document * | 5 | |
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| | | | TECHNICAL FIELDS SEARCHED (Int.Cl.7) |
| | | | B66F |
| The present search report has been drawn up for all claims | | | |
| Place of search THE HAGUE | | Date of completion of the search 28 January 2000 | Examiner Van den Berghe, E |
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 11 9168

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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28-01-2000

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82