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LIFTING DEVICE

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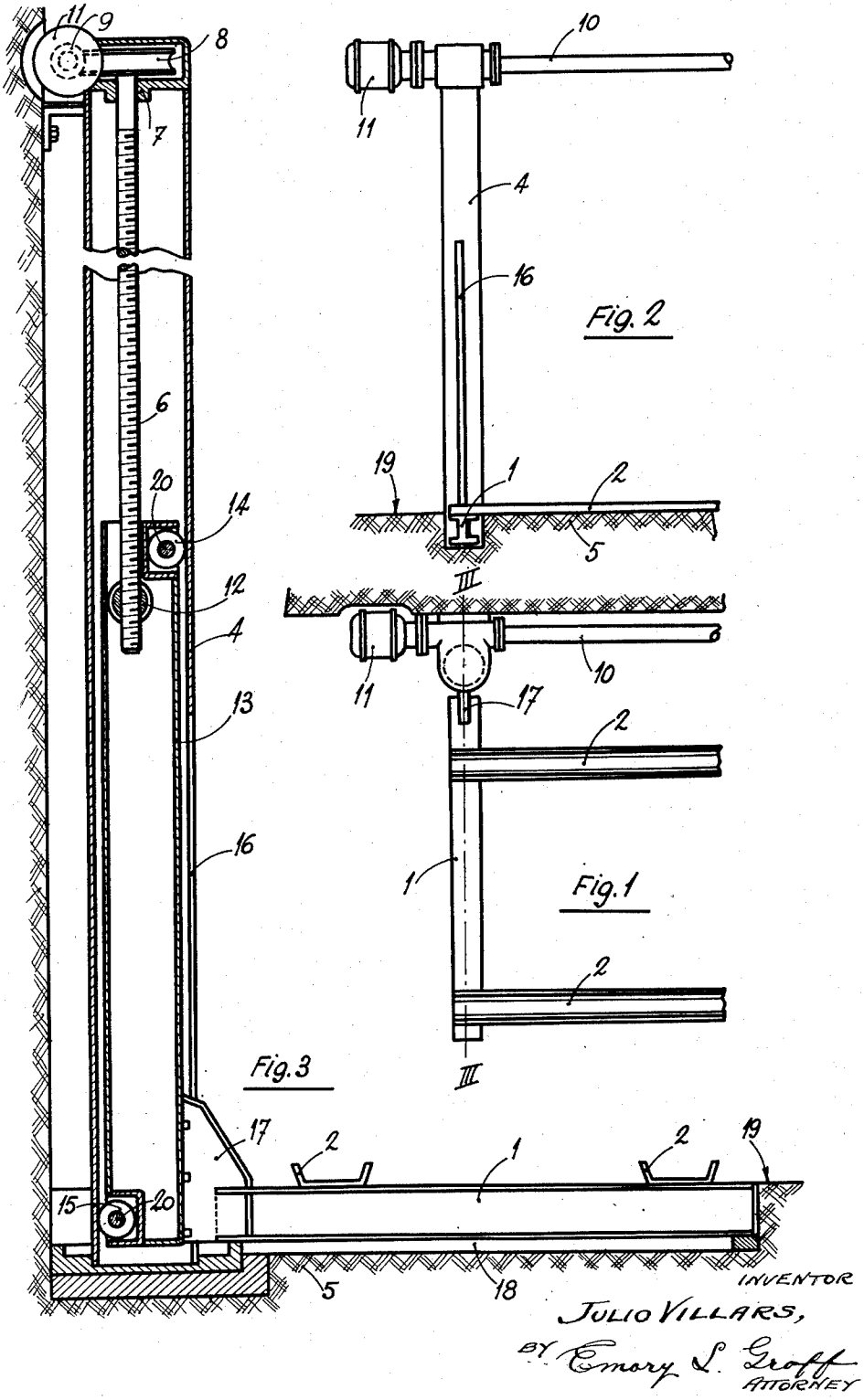


Fig. 2

Fig. 1

Fig. 3

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LIFTING DEVICE

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2 Claims. (Cl. 254—92)

1

The lifting devices actually in use for the lifting of vehicles for instance do not give entire satisfaction in all cases. In fact, their price is sometimes relatively high and if it is wished to avoid important foundations-work, these devices require stationary superstructures which hinder the free traffic of the vehicles in the room, equipped with such a lifting device. Various designers appreciating this serious inconvenience, have remedied it partially by devising lifting devices having four columns enclosing lifting mechanisms which actuate two rails or members provided for receiving the load to be lifted. Each of these members is connected at its two ends to the lifting mechanism. Further, in their lowermost position, these members become lodged in channels provided in the ground in order that their upper face be located in the plane of the ground of the room. Thus, these lifting devices allow of the vehicle passing between the four columns when the rails are in their lowered position. Nevertheless, it is clear that these four columns hinder the free traffic of the vehicles in the room.

Further, in the known lifting devices, the lifting mechanism is protected by sleeves or other devices of this kind. But, the experience has shown that these devices are most usually insufficient for insuring an efficient protection of the lifting mechanism against the access of dust, water, mud, etc. during cleaning and washing of the vehicles. This mud causes evidently a rapid wear of the vital organs of the lifting mechanism so that frequent and costly overhauling is necessary.

The present invention has for its subject a lifting device comprising members adapted to receive the load to be lifted, actuated vertically by a lifting mechanism housed in supports. This device tends to eliminate the cited inconveniences owing to the fact that the members adapted to receive the load are connected at one of their ends alone to the lifting mechanism, guiding means with their fixed point on the supports taking up the tilting moment due to the load carried by the said members.

The annexed drawing shows schematically and by way of example a form of construction of the lifting device.

Fig. 1 is a partial plan view;

Fig. 2 is a partial view in elevation;

Fig. 3 is a view drawn at a larger scale of a section along line III—III of Fig. 1.

In the form of construction represented, the lifting device comprises lifting members constituted by arms 1 (one of which alone is represented) adapted to carry the load to be lifted. These members are connected to each other by rails 2 which may be simply laid on the arms 1 or assembled to the latter. The arms 1 are connected each at one of their ends alone to the lifting mechanism housed in the support 4 rigidly fastened to the ground 5 and arranged preferably in the proximity of a partition or a wall.

2

In each support 4 is housed a screw 6 revolving in a bearing 7 and equipped at its upper end with a gear wheel 8 resting on a thrust bearing (not represented). This gear wheel meshes with an endless screw 9 fastened to a transmission shaft 10 driven by a motor 11.

The screw 6 threads a nut 12 held by a sleeve 13 carrying an arm 1. The sleeve 13 moves in the support 4 and is guided within the latter by rollers 14, 15. These rollers are mounted on axles 20 arranged perpendicularly relative to the screw 6 and rigidly fastened in the walls of the sleeve 13. The rollers roll along the support 4 and maintain the sleeve 13 in a vertical position.

The operation of the device described with reference to the annexed schematic drawing is similar to that of known lifting devices of the same kind and in which the lifting members 1 are connected at each of their ends to the lifting mechanism. Nevertheless, in these known devices the washing water loaded with mud can reach the screw relatively easily and cause a prematured wear of the nut. Further, these lifting devices necessitate at least two members 1 arranged parallel with respect to one another and connected at each of their ends with a lifting mechanism; it follows then that these known lifting devices comprise at least four columns or supports emerging from the ground. The two additional columns as compared to the new device may constitute a very serious hindering to the traffic of vehicles in the room where the lifting installation is erected.

On the contrary, in the described installation, the support 4 surrounds in all directions the screws 6 and protects it entirely against the access of mud projected during washing. This support 4 is provided with a single longitudinal opening 16 extending over a portion of its height allowing for the vertical displacements of a connecting member 17 rigidly tying the sleeve 13 to the arm 1. But the mud which can penetrate to the interior of the support 4 through this opening 16 cannot reach the screw 6. In fact, the sleeve 13 covers entirely the opening 16 and the rollers are arranged in housing which separate them entirely from the interior of the sleeve 13.

Lastly, the large distance separating the upper end of the opening 16 from the upper end of the sleeve 13 when in its lowered position (Fig. 1) forbids practically any mud from being projected on to the screw 6.

The rollers 14 and 15 being arranged at the ends of the sleeve 13, it may be seen that they are able to take up in an efficient manner the tilting moment due to the load carried by the arm 1. Depending on the importance of the load to be lifted, several arms 1 may be used, operated each by a screw 6 housed in a support 4. The endless driving screws 9 may be connected mechanically with one another by the transmission shaft 10. For the lifting of the vehicle, two arms 1 are sufficient in general. In their lowered position, these arms 1 become lodged in channels 18 in such a manner that their upper face be located in the plane of the ground 19 of the room. Lastly, the rails 2 being removable, it may be conceived easily that the lifting device, when not in use, has not a single member emerging from the floor and capable of hindering the free traffic of the vehicles.

The supports may be placed in a line along a wall for instance, or according to any other arrangement necessitated by the shape of the room or by other requirements of the installation or of the service.

A form of construction of the device and the object of the invention has been described here by way of example and with reference to the annexed schematic drawing, but it is evident that the various members described and represented may be replaced without further explanation by their known mechanical equivalents.

For instance, the screw 6 could be replaced by any other known suspension member such as a cable, a rack, a hydraulic jack etc. having its fixed point on the support.

The gear wheel 8 and the endless screw 9 may be replaced by any transmission members capable of playing the same role such as a couple of conical pinions, helicoidal gears etc.

I claim:

1. In a vehicle lifting device, the combination, comprising means engageable with the vehicle to be lifted, a pair of sleeves each connected at its lower end to the first means and carrying roller means near its upper end and at the side facing the first means and near its lower end and at the opposite side a second roller means, a pair of supporting tubes each receiving a sleeve and with its interior engaging the roller means thereof, each tube having a slot of predetermined length and receiving a part of the first means, each tube being supported axially at its upper end and supported against transverse motion at its lower end, a pair of nuts each mounted in the upper end of a sleeve, a pair of screws each coacting with one of said nuts and rotatably suspended in the upper end of a related tube, and means driving the screws.

2. The device according to claim 1 and wherein each sleeve, in a predetermined position, covers the entire slot in its support tube.

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