



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
13.06.2007 Bulletin 2007/24

(51) Int Cl.:
E04F 21/24 (2006.01)

(21) Application number: **06425222.4**

(22) Date of filing: **30.03.2006**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**
Designated Extension States:
AL BA HR MK YU

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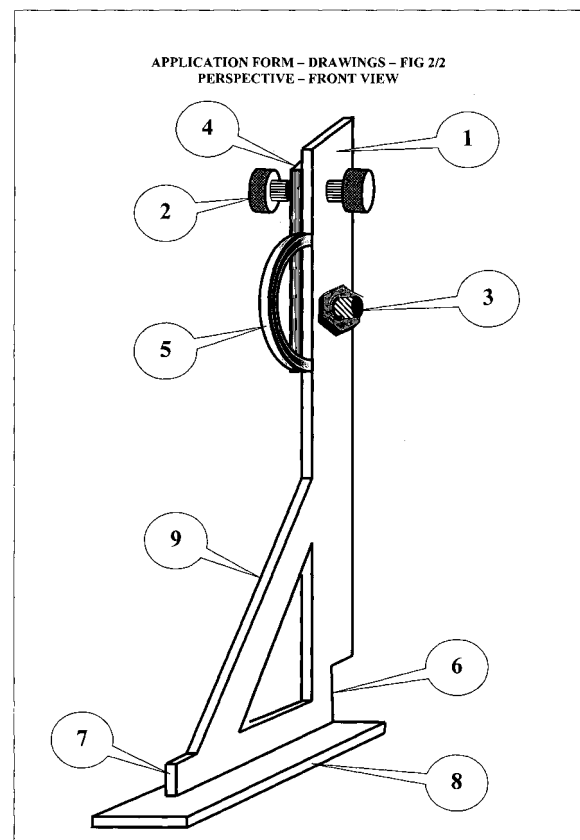
(30) Priority: **07.12.2005 IT RN20050070**

(54) **Muscular force operated floor screed laying fixture**

(57) The floor screed laying fixture, which finds its application in building practice, is used to obtain level concrete mix screed points, needed for laying down cement mix screed perfectly level and at 90° from the reference height points located on vertical surfaces and, at the same time, perpendicular to the horizontal cement mix to be laid down.

The fixture consists of following parts:

- n°02 straight metal bars: a long vertical bar and a short vertical bar set at 90° to each other;
- n° 01 diagonal bracing metal bar;
- n° 01 handgrip made of half-oval metal rod placed on top of the long vertical metal bar;
- n° 01 half-oval shaped handgrip placed on top of the vertical metal bar;
- n° 01 sliding metal plate moving in vertical direction, equipped with n° 02 bolts-anchored to a threaded nut-and an adjustable threaded bolt fitted with a knob at one end- anchored to a knob at the other end;
- n° 01 horizontal rectangular metal plate fitted beneath the short horizontal metal bar.



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Description

A - Technical field

[0001] The present invention finds its use in concrete and masonry construction practice: it enables to obtain smooth and levelled reference screed points, indispensable to achieve sand and/or cement floor screeds perfectly flat and at 90° angle with respect to the reference height points, set upon the vertical surfaces such as walls and columns and, at the same time, perpendicular to the entire sand and/or cement floor screed being laid down before laying the floor covering or tiles.

[0002] The screed fixture consists of:

- n. 02 straight metal bars: a long vertical bar (1) and a short horizontal bar (7) set at 90° to each other; these two metal bars are held in perfect alignment by n. 01 diagonal bracing metal bar (9);
- n. 01 handgrip (5) made of half-oval shaped metal rod placed on top of the long vertical metal bar, which enables to apply "muscular" hand force in the top-to-bottom direction of fixture and vice versa;
- n. 01 vertical rebate (6) machined at the heel of the long vertical metal bar
- n. 01 sliding metal plate (2) moving in vertical direction, equipped with n. 02 bolts: a fixed bolt (3) - anchored to a threaded nut - and an adjustable threaded bolt (4) fitted with a knob at one end - anchored to a threaded knob at the other end - the sliding plate is necessary to obtain the desired height point setting, placed on the upper part of the long vertical metal bar
- n. 01 horizontal rectangular metal plate (8) fitted beneath the short horizontal metal bar (7)

B - Background art (current state-of-the-art)

[0003] In current building industry practice, in order to lay a cement and/or sand screed, one has to start by first locating and setting height reference points on the surface of the existing walls of a room; the location and setting of reference points, can be done with the help of a common graduated rule, by taking the existing ceiling as the starting reference point; then one would measure vertically down the existing vertical wall until the desired height point is reached.

[0004] Once the desired reference height point has been obtained, the same value is set and marked on all the vertical surfaces - existing walls or columns - by means of suitable tools and instruments.

[0005] When all the reference height points have been set and marked off, one proceeds with the formation of the concrete screed. At this point the concrete-layer pours the concrete mix below each vertical height point previously marked and, with the help of a graduated rule he determines the final height value of the screed; then by means of a spirit level he obtains a plan or trace per-

pendicular and at 90° from the vertical height point. By so doing one gets the final screed concrete thickness, to be laid flat, necessary for accomplishing the successive guide pads or tracks, also made of concrete mix. The aforesaid guide pads or tracks are made along the perimeter of the vertical surfaces or walls and are indispensable to enable successive pouring and levelling of the whole floor surface.

[0006] In fact, complete filling of the flat surface by concrete mix, is carried out by hand with the aid of an aluminium straight edge, which is allowed to slide over the perimeter guide pads or tracks previously obtained; and the concrete mix layer or screed thickness thus obtained is perfectly flat and perpendicular to the vertical height points, thus yielding a smooth and uniform surface.

[0007] The use of rule and spirit level to obtain the final height point value over the concrete mix screed, from the vertical height point, is by no means functional and effective, but the setbacks accruing from it are low speed, poor work performance and precision.

C - Disclosure of invention

[0008] Having determined the reference vertical height point on the wall, by the method illustrated previously; having then established the value of the height from the vertical height point to the rough floor below; thus, after subtracting the thickness of the concrete screed to be laid down and obtained the desired final height, the invention fixture adjustment, in relation to the same final height as referred to above, is carried out as follows: move upwards the steel sliding plate (2) till the desired height measured by means of a graduated rule is reached, then lock it on this position; at this stage the fixture is ready for use.

[0009] The next step consists in laying down the concrete by the operator under each and every vertical height point just marked-off, by using the present fixture through the handgrip (5) placed on the vertical alignment. This operation will be carried out in the following way: the operator will have to grip and hold the fixture in front of him, allowing it to slide along the vertical wall, by imparting it a manual alternating up-and-down motion in direction top-to-bottom-to-top.

[0010] By this action, one will obtain flattening-out of the concrete mix by means of the horizontal alignment and the horizontal rectangular steel plate (8) placed under the aforesaid alignment. Such flattening will create a rectangular track perpendicular and perfectly at 90° angle from the vertical height point.

[0011] In the very instant the rectangular sliding steel plate (2) anchored onto the upper end of the long vertical bar (1), will match perfectly with the height point vertically above it, the desired final height will be achieved, thus obtaining on the floor rectangular height points of concrete mix screed perfectly horizontal and at 90° perpendicular to the height points placed on vertical wall or column; each of these operations are performed in keenly

advantageous times and with an exceptional degree of precision, equal for all the height points of screeds obtained.

[0012] It must be pointed out that the bottom face of the horizontal rectangular steel plate (8) will leave a trace on the concrete screed, which will determine the width of the guide pads or rails to be laid down. Therefore, the completion of guide pads or rails made of concrete mix, will have to be "levelled" or "smoothed down" by means of aluminium straight edge, in order to obtain a plan perfectly horizontal and perpendicular to the vertical height points.

[0013] At this stage, the operation of filling with concrete mix the empty floor spaces, between one rail and another, will take place; the concrete mix screed will be levelled and smoothed down by means of aluminium straight edge, which will be made to slide on the guide pads or rails previously obtained, thus forming a plan uniform and perpendicular to all vertical height points.

[0014] Hence, the main goal of the present invention is that of getting level rectangular reference floor screed of concrete mix, perfectly perpendicular at 90° to the height points placed on vertical walls or columns.

[0015] Another goal of the present invention, is that of performing two operations simultaneously in one step, that is: obtaining the final floor screed thickness perpendicular at 90° angle to the walls or columns. Yet another goal of the present invention is that of performing above illustrated operations employing a fast, simple and economical fixture, at a contained cost in proportion to the advantages that can be attained.

[0016] Further scopes and features of the present invention will appear more obvious, from the following detailed description of one typical construction of fixture, preferred but not exclusive, taken as an example but not as a limitation, expressly referred to the attached drawings.

D - Brief description of drawings

[0017] Reference is made to enclosed drawings Fig. 1/2 and Fig. 2/2 showing the main parts of the invention.

[0018] Fig. 1/2 shows a side view of the fixture, featuring:

- Item N.1: a long vertical metal bar equipped with a rectangular sliding metal plate - Item N.2 - clamped on its upper end, guided by a slot machined on it, to enable it to be shifted along its axis in a top-to-bottom direction and vice versa, constrained by a bolt - Item N.3 - anchored with a nut to Item N. 1 to ensure perfect alignment and easy sliding over Item N. 1.

[0019] Further, the rectangular sliding metal plate Item N.2, in turn, is equipped with a second threaded bolt - Item N.4 - with knob shaped head on one end and a threaded knob-shaped anchor nut on the other, to set and lock the rectangular sliding metal plate Item N.2 to

the desired height point.

[0020] Further, the upper part of the fixture long vertical metal bar is provided with a half-oval shaped metal rod handgrip - Item N.5 welded to the long vertical metal bar N.1, which enables to operate the present invention by applying muscular force in vertical top-to-bottom direction.

[0021] The long vertical metal bar N.1 has a rebate - Item N.6 - milled on its heel: the reason for rebating the heel of Item N.1, is to prevent the fixture from hitting the strip filled perimeter expansion joints - employed to ease the expansion of the concrete screed - during the use of this invention. Item N.7 shows the shorter horizontal metal bar: this is perpendicular to, and perfectly set at an angle of 90° with respect to the long vertical metal bar Item N.1. Moreover, the shorter horizontal metal bar Item N.7, is connected at 90° angle to the long vertical metal bar Item N.1, by electric welding.

[0022] Further, Items N.1 and N.7 are connected to each other by a diagonal metal bracing bar - Item N.9 - set at 45° angle by means of controlled electric welding, to prevent any deviations from the 90° angle alignment between Items N.1 and N.7, due to induced heat stresses and strains.

[0023] Fig. 2/2 shows a perspective front view of the fixture, featuring: The horizontal metal bar - Item N.7 - has a rectangular metal plate - Item N.8 - welded horizontally beneath the whole base length, with the purpose of marking a rectangular trace upon the concrete mix screed.

[0024] The horizontal metal plate - Item N.8 - also, in turn, is perpendicular to and perfectly at 90° angle to the long vertical metal bar Item N.1.

[0025] The rectangular metal plate - Item N.8 - has the same length dimension as the horizontal metal bar - Item N.7 - but it is wider (being rectangular) than Item N.7 and, therefore, it becomes perpendicular to horizontal metal bar, Item N.7, and perfectly at 90° from it, forming a perfectly horizontal rectangular surface under the two Items N.1 and N.7, also perfectly perpendicular at 90° to the long vertical metal bar Item N.1.

[0026] The thickness of the horizontal metal plate - Item N.8 - is greater than that of Items N.1 and N.7.

[0027] The purpose of making this thickness greater is that one of obtaining a more precise and defined trace.

[0028] With reference to the side view of figure 1/2 the long vertical metal bar, Item N.1, and the horizontal metal bar, Item N.7, not only are these elements connected to each other at a perfect 90° angle, by means of electric welding; but the diagonal metal bracing bar - Item N.9 - also is connected to Items N.1 and N.7 by electric welding.

[0029] The function of a diagonal metal bracing bar, Item N.9, called also "bend-preventive", is that of performing a perfect operation of the present invention, with the view of preventing that, during its operation by the application of a muscular vertical force in a top-to-bottom direction, and vice versa, the fixture might be subjected

to such values of bending which might compromise the alignments of Items N. 1 and N.7; thus enabling the correct use of the present invention, that is the bend-preventive bar - Item N. 9 - placed diagonally between the horizontal and the vertical Items N.1 and N.7, ensures that the alignments of the two Items N.1 and N.7 do not go out of their perfect 90° angle alignment, in such way that also the horizontal metal plate - Item N.8 - welded beneath the horizontal metal bar, Item N.7, does not undergo alterations that might compromise its perfect perpendicular equilibrium at 90° angle with the long vertical metal bar Item N.1.

[0030] As above illustrated, the present invention is made up of Items N. 1/ N. 2/ N. 3/N. 4/N.5 N. 7/N.8 and N. 9.

E - Best mode for carrying out the invention

[0031] All the parts of the present invention are totally made of steel, connected between them by electric welding and bolts; the only exceptions being a bolt and a nut made of metallic material with a plastic knob.

[0032] Particular mention must be made about the extremely constructive simplicity of the present invention, which enables its manufacture at extremely reasonable costs.

[0033] Further, the present invention is susceptible of numerous variants and modifications, all included within the domain of the invention concept.

[0034] The present invention, apart from being operated by muscular force, can be modified to be operated by means of an electric motor, a hydraulic motor, or a pneumatic motor.

[0035] All the materials can be replaced with other elements technically equivalent.

[0036] The materials, the shape and the dimensions can be of any kind depending upon the requirements, provided that they are included in the concept of solution illustrated above and claimed further on.

F - Industrial applicability

[0037] As previously described, despite the manufacturing alternatives the present invention cannot have extensions of application outside the building field.

G - Extent of the required protection

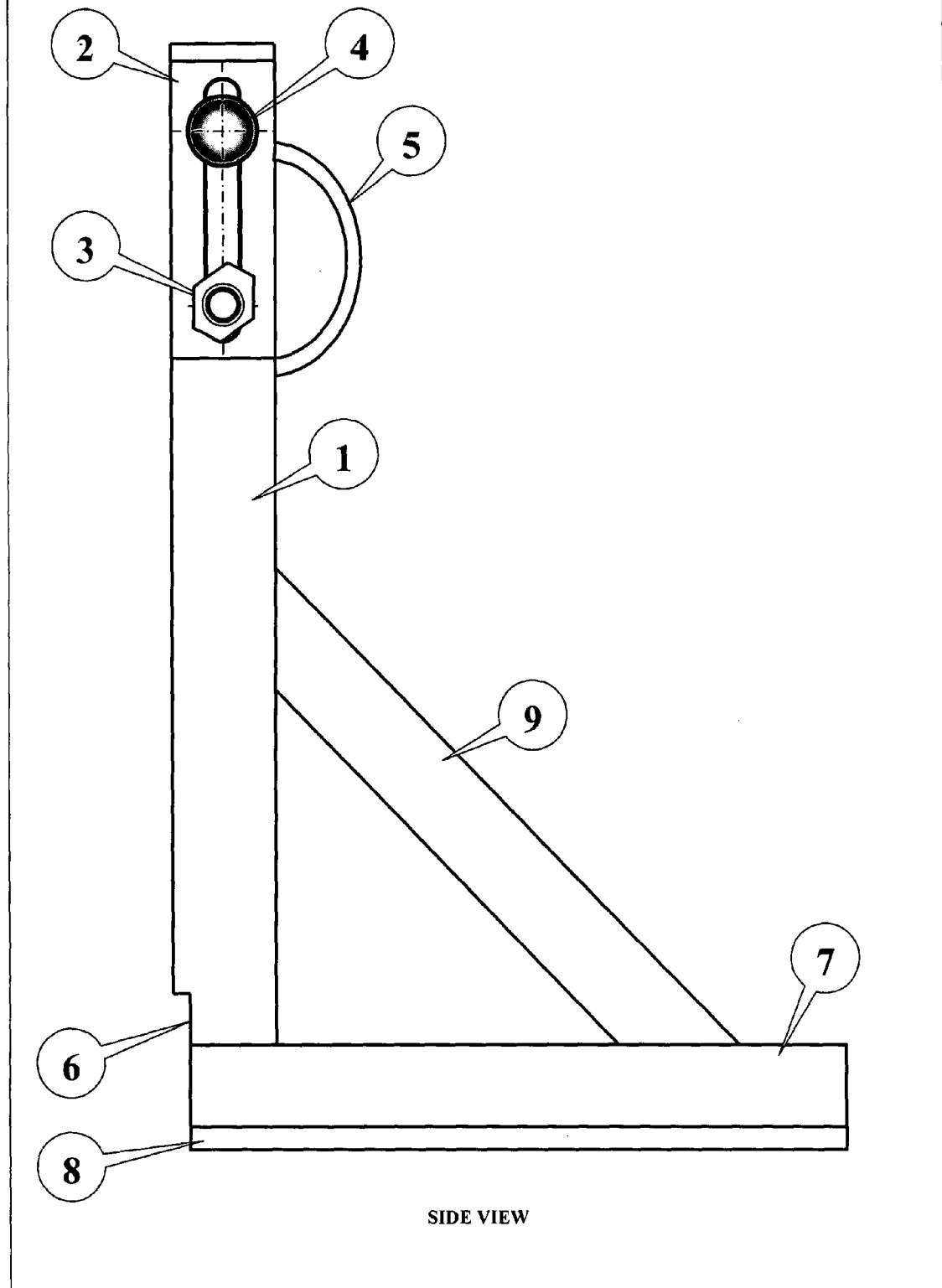
[0038] Having fully described the present invention, with reference to a preferred typical example of construction and to some alternatives for its implementation, which fall into the domain of the invention concept; it is obvious the inventor's intention of protecting its invention from any and all forms of construction which do fall within same concept of invention which do achieve equal usefulness of results, with regards to both the description that precedes, and the claims which follow; protection of the invention from all kinds of implementation and vari-

ations which are reflecting the spirit and the scopes of the invention itself, is also required.

5 Claims

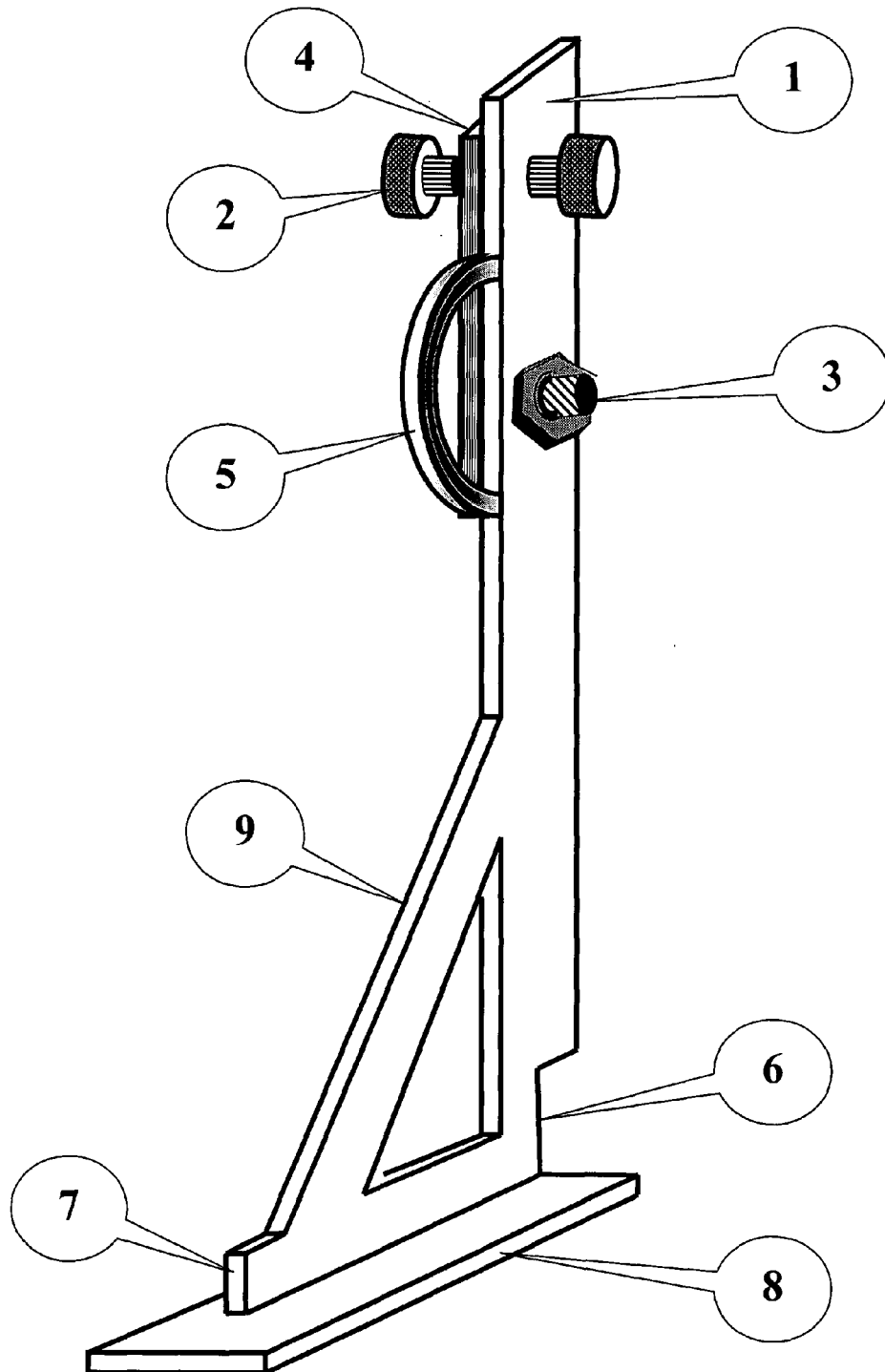
1. The floor screed laying fixture, basically consists of n. 2 metal assemblies of different lengths, joined perpendicular to each other. It is suitable for determining horizontal level points on a floor in relation to vertical points marked on vertical surfaces: walls and/or columns,
The longer assembly, located vertically over the shorter one, is **characterized by** the fact that, it features a half-oval shaped metal handgrip, welded on the front edge of its upper end, which enables the application of muscular force on the fixture.
The shorter assembly, located horizontally underneath the bottom of the longer vertical assembly, is **characterized by** the fact that a horizontal rectangular metal bar is fitted beneath it and perpendicular to the vertical assembly itself.
2. The fixture, as per claim n. 1, is **characterized by** the fact that, the two assemblies are connected and strengthened by a diagonal metal bracing bar.
3. The fixture, as per claims n. 1 and n. 2, is **characterized by** the fact that, the longer vertical assembly features a vertical rebate machined on its heel.
4. The fixture, as per previous claims n. 1-2-3 is **characterized by** the fact that, the longer vertical assembly has, fitted on its upper end face, a sliding metal plate that can be adjusted vertically up-or-down: this plate has a slot machined through its thickness and it is anchored to the fixture by means of threaded bolt and nut which enable, at the same time, the sliding and setting of the plate; a second threaded bolt with knob-shaped head and knob-shaped nut, is present and it has the scope of locking the sliding plate on the desired height point.
5. The fixture, operated by the application of muscular force, as per claims n. 1-2-3-4, has the characteristics described and illustrated in the attached drawings as well as in the above specified scopes.

APPLICATION FORM – DRAWINGS – FIG. 1/2



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APPLICATION FORM – DRAWINGS – FIG 2/2
PERSPECTIVE – FRONT VIEW



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