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(54) **Adjustable metal staircase**

(57) The invention relates to a modular, adjustable metal staircase characterized in that it includes fitted modular units to be assembled on the spot without the need of arranging "ad hoc" parts for any application.

In order to allow the rise to be adjusted so that the staircase can be arranged for any difference of height, suitable slotted holes are provided to adjust the height of each step.

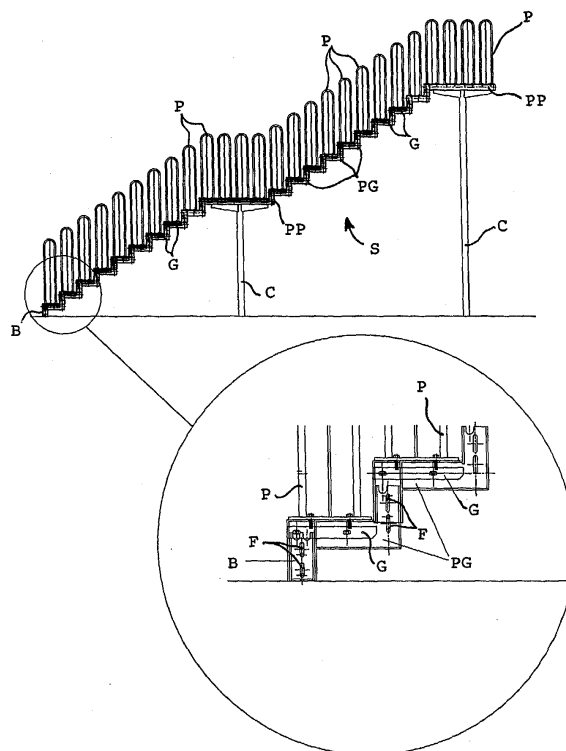


FIG. 2

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Description

[0001] The present invention relates essentially to the field of prefabricated houses and particularly a staircase of metal carpentry consisting of fitted modular units designed to be easily assembled by bolting. This facilitates at most the transport and the assembling on the spot.

[0002] Stairs to enter prefabricated houses are presently known and have to be made to measure by arranging the requested height, inclination and number of steps beforehand in workshop.

One object of the present invention is to provide stairs for the above-mentioned use, characterized in that they consist of fitted modular units to be assembled on the spot, without the need of arranging "ad hoc" parts for any application.

A second object of the invention is to provide stairs of different size and types by adding and taking away easily single fitted units.

A third object is to allow the rise to be adjusted so that the staircase can be arranged for any difference of height. This is accomplished by providing suitable slotted holes to adjust the height of each step.

[0003] A better understanding of the invention will result from the following detailed description with reference to the accompanying drawings that show a preferred embodiment thereof only by way of a not limiting example.

In the drawings:

Figure 1 shows some different types of stairs according to the invention;

Figure 2 shows a section view of the base members which the stairs consist of;

Figure 3 shows the assembling system of base member, step supporting member, and banisters;

Figure 4 similar to the preceding Figure shows the modular footpace supporting member.

[0004] With reference to the Figures listed above, the modular staircase of the present invention consists essentially of a pair of side base members B, a pair of footpace supporting members PP for each footpace, to which a pillar or upright C provided with upper support arms for such pair of footpace supporting members PP, and a plurality of steps, each of them has in combination: a pair of step supporting end members PG, a step G, one or more side banisters P.

According to the invention, base members B are bolted to the lower arms of the step supporting members PG of the lower step of the staircase, after having bolted the corresponding step G thereto. Thereafter, the following steps are secured by bolts to such lower step, and the rise is adjusted by suitable slotted holes F according to the requirements and the height to be reached accord-

ing to the number of steps to be installed. The banister members P are secured to the ends of each step, even if it is evident that only one banister P can be installed for each step in case the flight of the staircase is close to a wall.

As can be clearly seen in the figures, each step supporting member PG is essentially Z-shaped, the central horizontal portion of which supports step G, and the lower and upper arms perpendicular to the central connecting portion are directed downwards and upwards, respectively. At least one of such vertical arms is provided with such pair of elongated holes or vertical slots F adjusting the rise, in which the securing bolts are fitted.

In the embodiment shown such securing and adjusting slots F are preferably arranged only in the upper arm directed upwards of each step supporting member PG, the base members B being provided with similar vertical slots.

It should be noted according to the present invention that each footpace supporting member PP is different from the corresponding step supporting members PG only by the greater length of its horizontal central portion.

At last, it should be appreciated that each pair of modular units (figures 3 and 4) forming the steps and the footpaces of the staircase according to the invention consist of two (right and left, respectively) members specular to each other.

[0005] Therefore, it is evident that the present invention provides flights and relative banisters with heights that can be easily modified according to specific requirements.

In the embodiment shown, banisters P consist of tubular "U"-bent members welded to a lower plate provided with mounting holes, and the base members B, the step supporting members PG, and the footpace supporting members PP are preferably provided with profiles having a "C"-shaped section to ensure the rigidity.

The present invention has been described and illustrated according to a preferred embodiment thereof, however, it should be understood that those skilled in the art can make a number of functionally and/or technically equivalent modifications without departing from the scope of the present industrial invention.

Claims

1. Modular, adjustable metal staircase **characterized in that** it includes fitted modular units to be assembled on the spot without the need of arranging "ad hoc" parts for any application.
2. Staircase according to claim 1, **characterized in that** in order to allow the rise to be adjusted so that the staircase can be arranged for any difference of height, suitable slotted holes are provided to adjust the height of each step.

3. Staircase according to any preceding claim, **characterized in that** it consists essentially of:
- a pair of base side members (B);
 - a pair of footpace supporting members (PP) for each footpace, to which a pillar or upright (C) provided with upper supporting arms for said pair of footpace supporting members (PP) is associated; and
 - a plurality of steps, each of them has in combination: a pair of step supporting end members (PG), a step (G), one or more side banisters (P).
4. Staircase according to the preceding claim, **characterized in that** the base members (B) are bolted to the lower arms of the step supporting members (PG) of the lower step of the staircase, after having bolted the corresponding step (G) thereto, the following steps being then secured by bolts to said lower step, and the rise being adjusted by suitable slotted holes (F) according to the requirements and the height to be reached according to the number of steps to be installed.
5. Staircase according to the preceding claim, **characterized in that** the relative banister members (P) are secured to the ends of each step.
6. Staircase according to any claim from 3 on, **characterized in that** each step supporting member (PG) is essentially Z-shaped, the central horizontal portion of which supports step (G), and the lower and upper arms perpendicular to the central connecting portion are directed downwards and upwards, respectively.
7. Staircase according to claims 2 and 6, **characterized in that** at least one of such vertical arms is provided with a pair of said elongated holes or vertical slots (F) adjusting the rise, in which the securing bolts are fitted.
8. Staircase according to the preceding claim, **characterized in that** said securing and adjusting slots (F) are preferably arranged only in the upper arm directed upwards of each step supporting member (PG), and that the base members B are provided with similar vertical slots.
9. Staircase according to claim 3, **characterized in that** each footpace supporting member (PP) has a central horizontal elongated portion, from the ends of which two vertical arms are directed upwards and downwards, respectively, said arms being the same as the arms of the step supporting members (PG).
10. Staircase according to any claim from 3 on, **characterized in that** each pair of modular units forming the steps and the footpaces consist of two (right and left, respectively) members specular to each other.
11. Staircase according to any claim from 3 on, **characterized in that** banisters (P) consist of tubular "U"-bent members welded to a lower plate provided with mounting holes.
12. Staircase according to any claim from 3 on, **characterized in that** base members (B), step supporting members (PG), and footpace supporting members (PP) are preferably provided with profiles having a "C"-shaped section to ensure the rigidity.

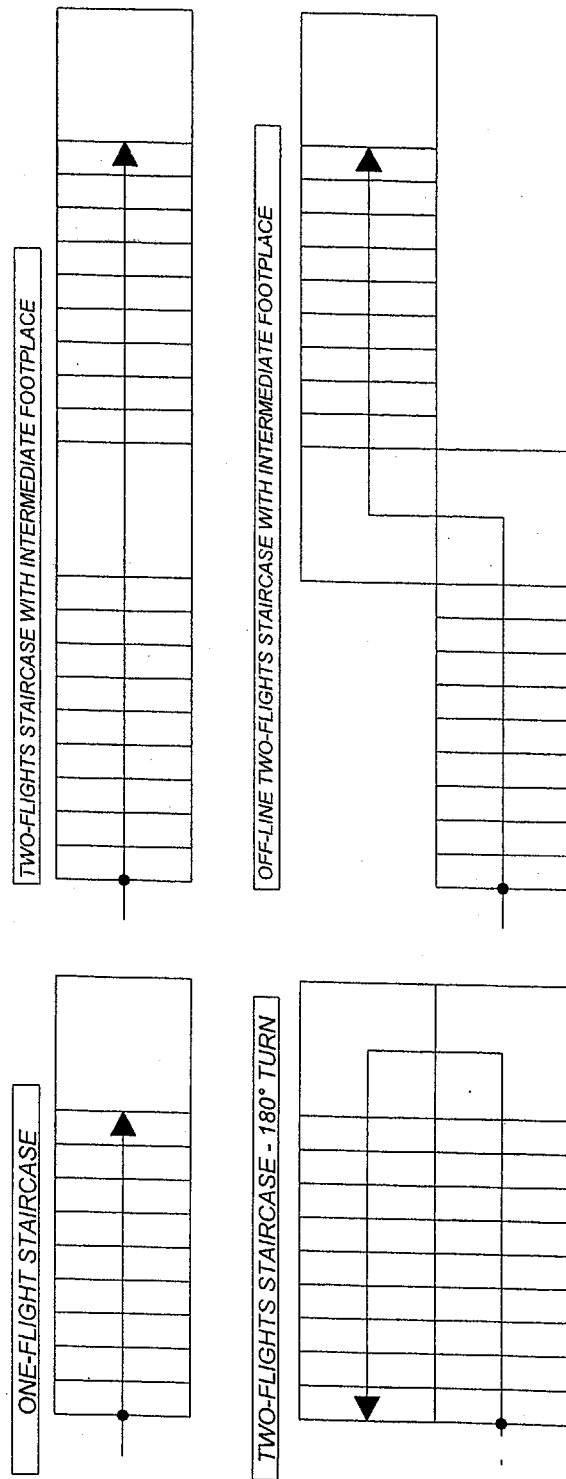


FIG. 1

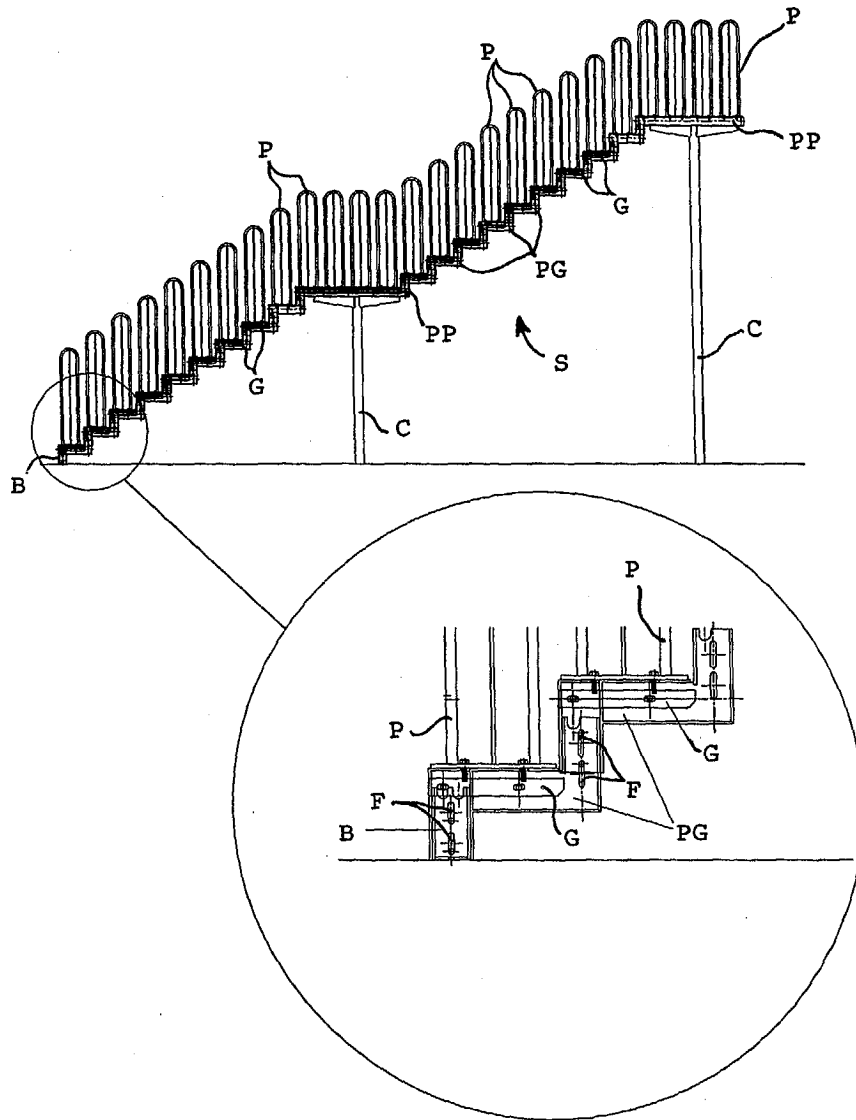


FIG. 2

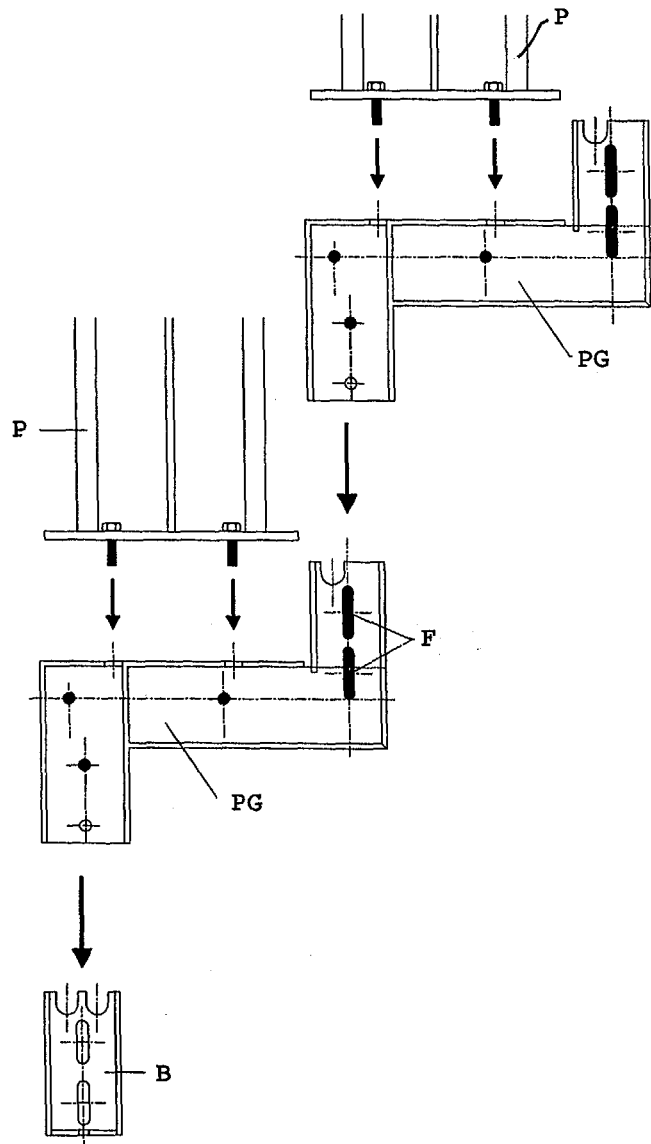


FIG. 3

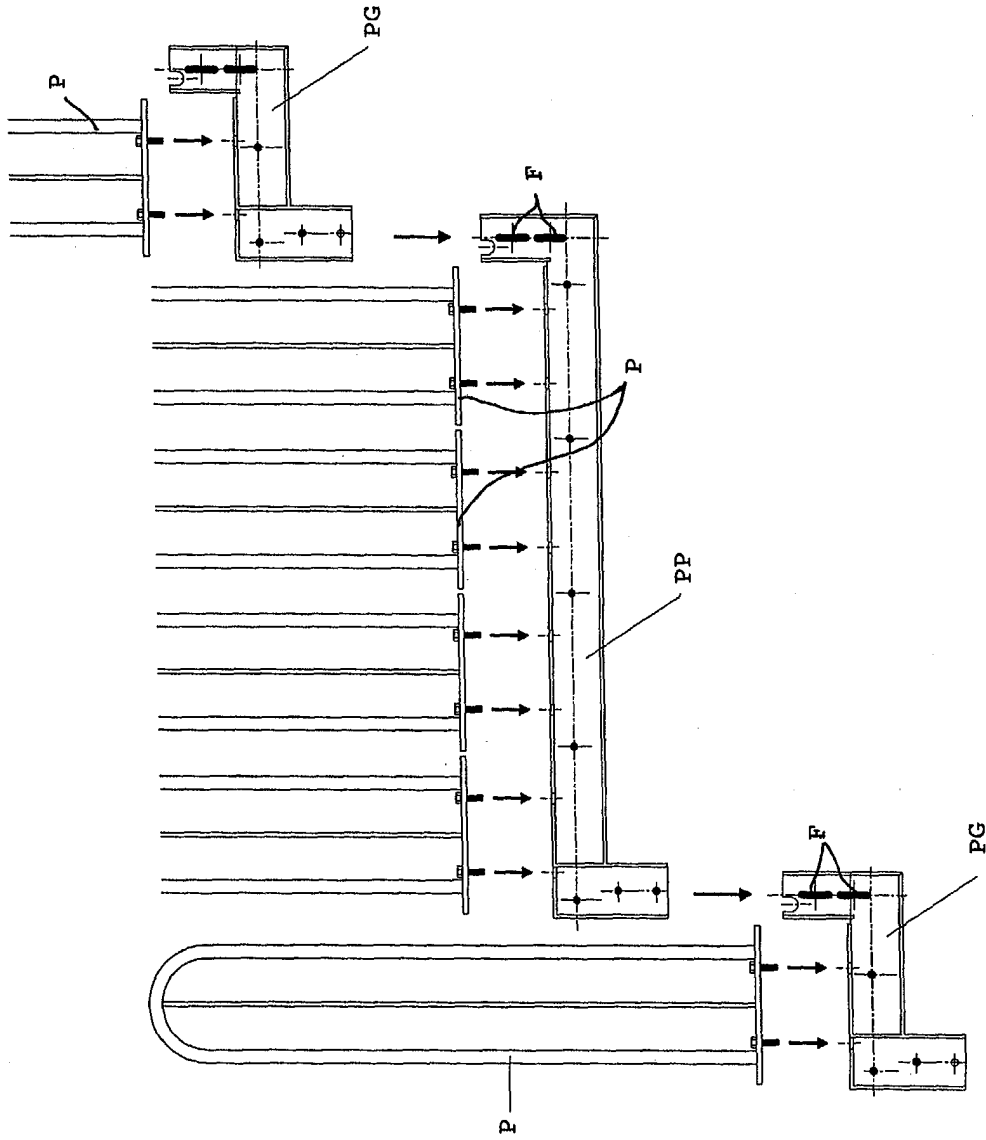


FIG. 4

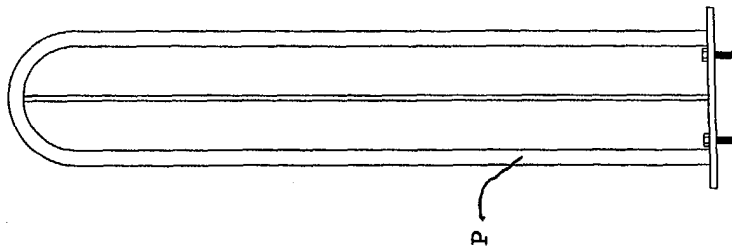


FIG. 5

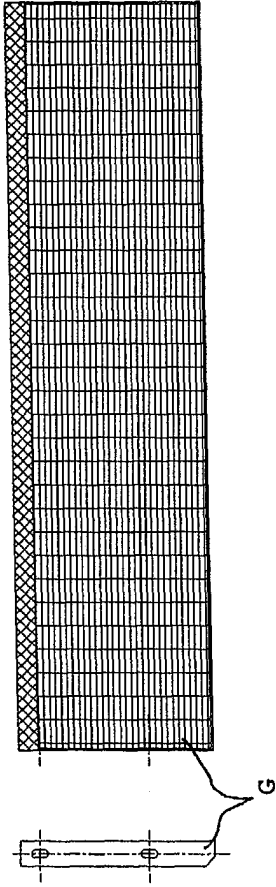


FIG. 6