

[54] CONSTRUCTION SET FOR THE PRODUCTION OF STRUTTING ARRANGEMENTS

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[22] Filed: **Apr. 26, 1971**

[21] Appl. No.: **137,261**

[30] **Foreign Application Priority Data**
Apr. 25, 1970 Germany..... 2020372

[52] U.S. Cl..... **52/637, 52/295, 52/716, 256/65**

[51] Int. Cl..... **E04h 17/14**

[58] **Field of Search** 52/637, 638, 717, 297, 52/292, 27, 731, 721, 690, 312, 716; 256/21, 24, 59, 65, 66, 22

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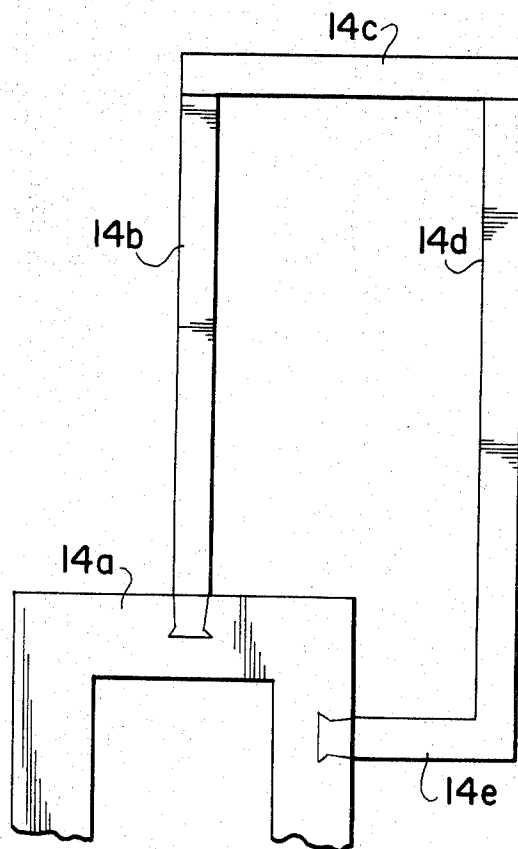
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[57] **ABSTRACT**

Construction set for the production of strutting arrangements with preferably skeleton like character and suitable for the production of supports, supporting constructions, frame constructions, connecting arrangements, scaffoldings, reinforcing arrangements, suspension arrangements and similar things, characterized in that it consists of individual elements connected with one another by plug connection without a bore.

6 Claims, 16 Drawing Figures



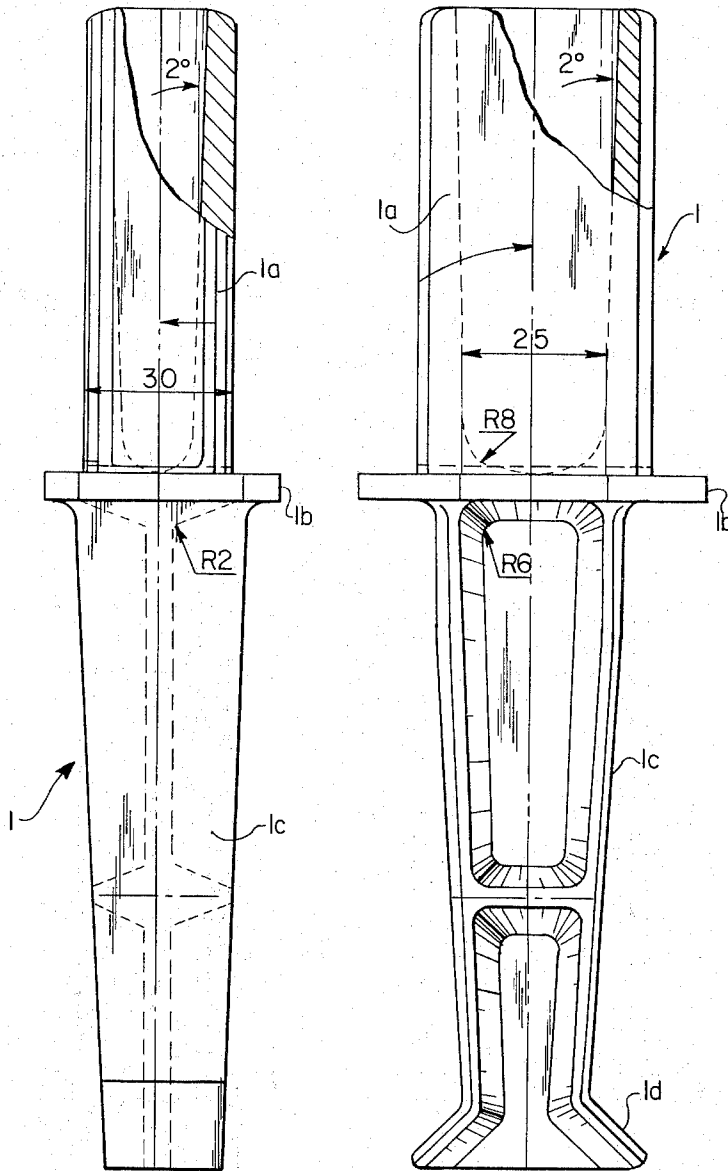


FIG. 2

FIG. 1

FIG. 4

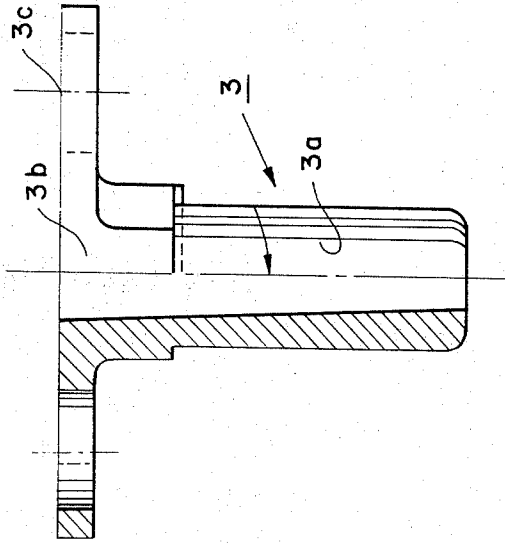


FIG. 4a

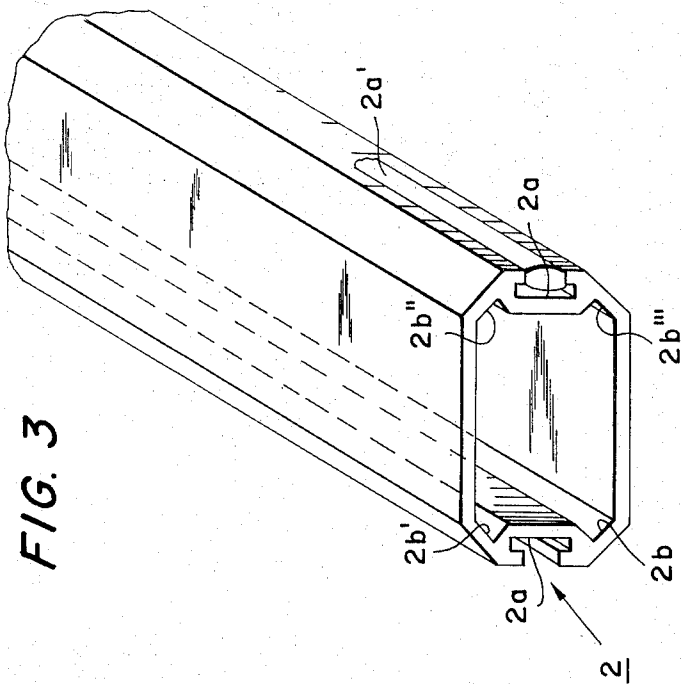
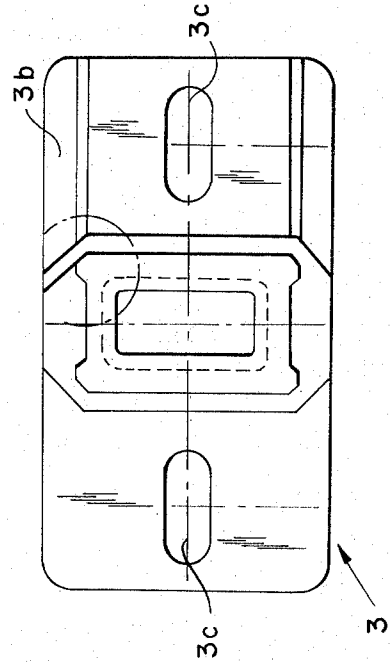
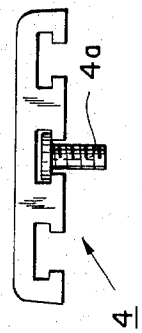


FIG. 3

FIG. 5



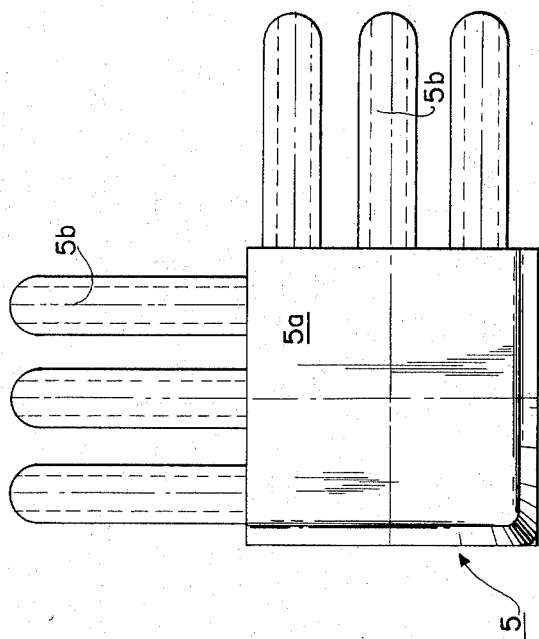


FIG. 6

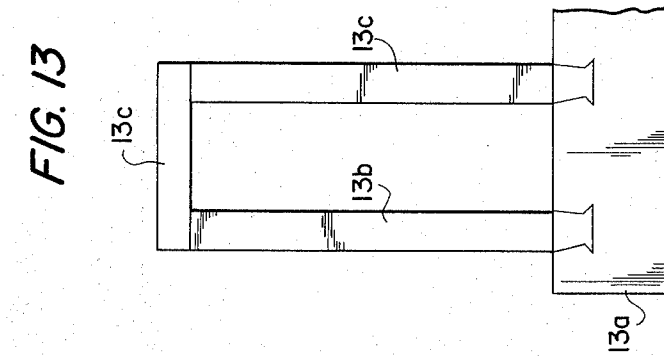


FIG. 13

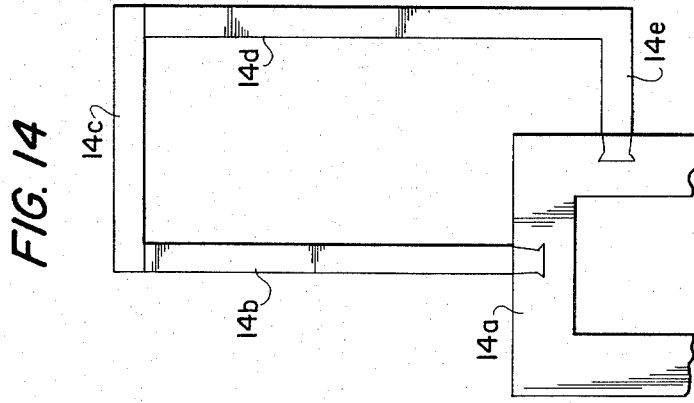


FIG. 14

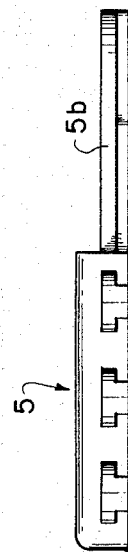


FIG. 7

FIG. 8

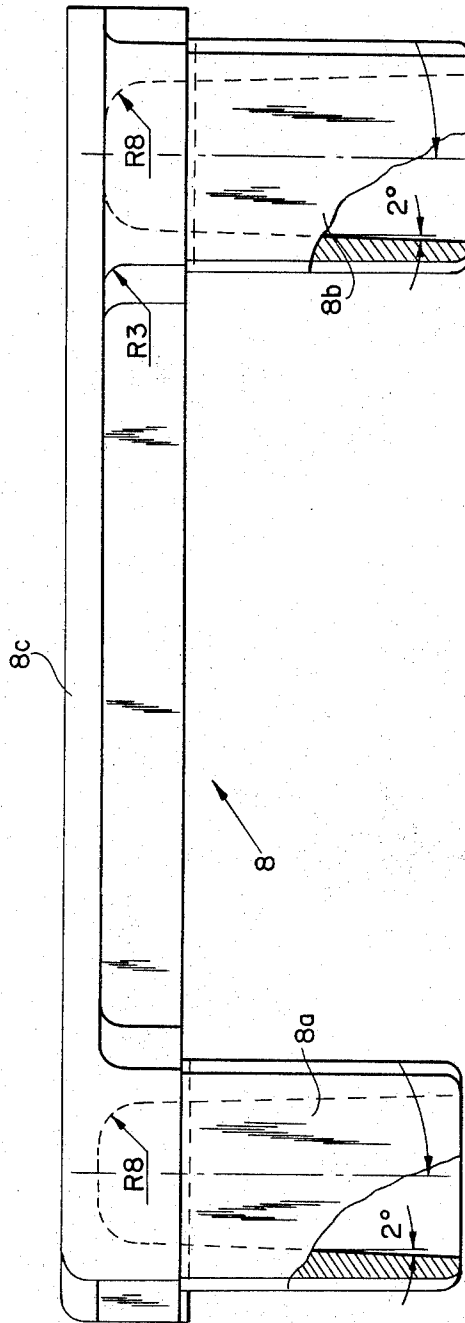
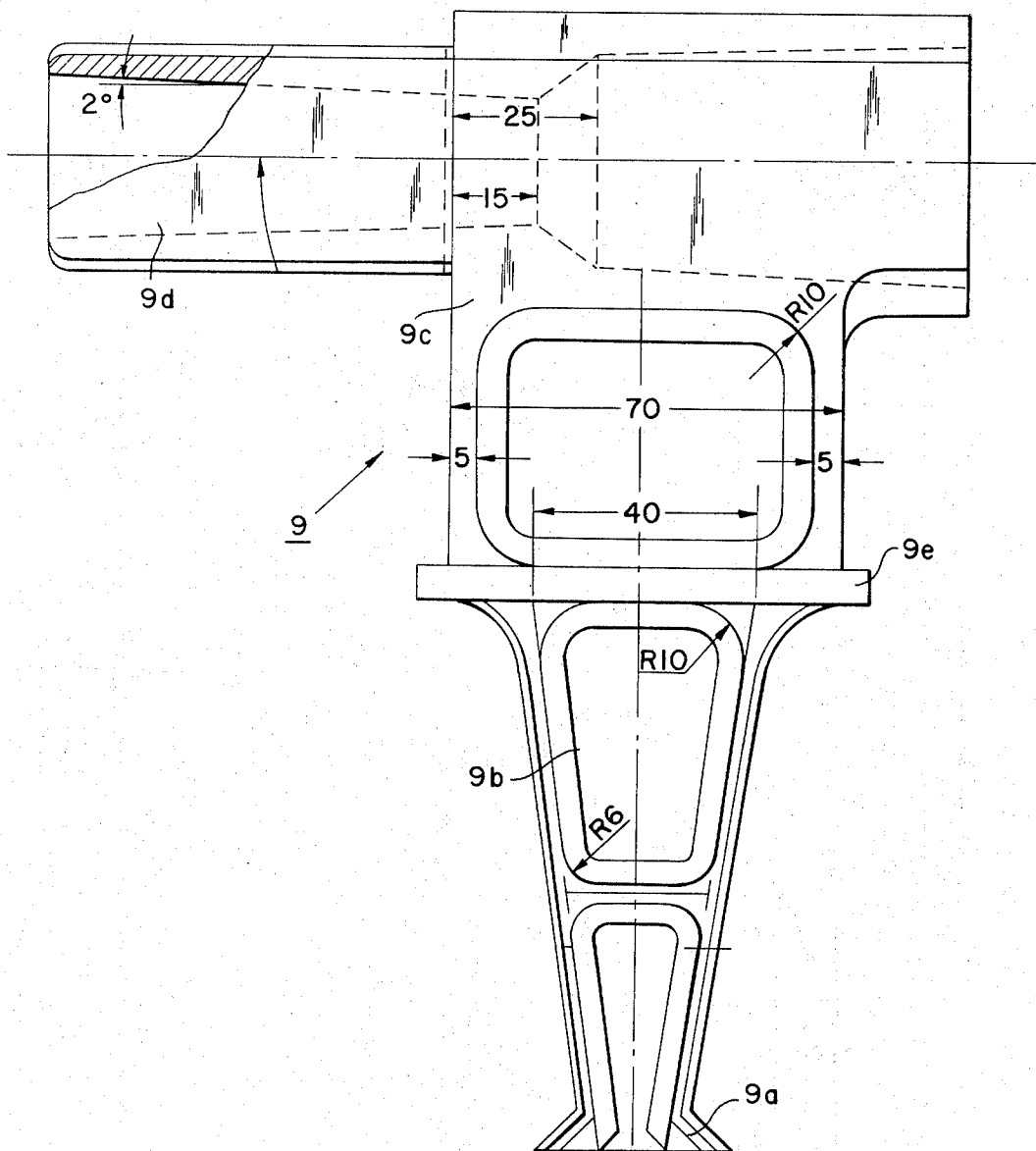


FIG. 9



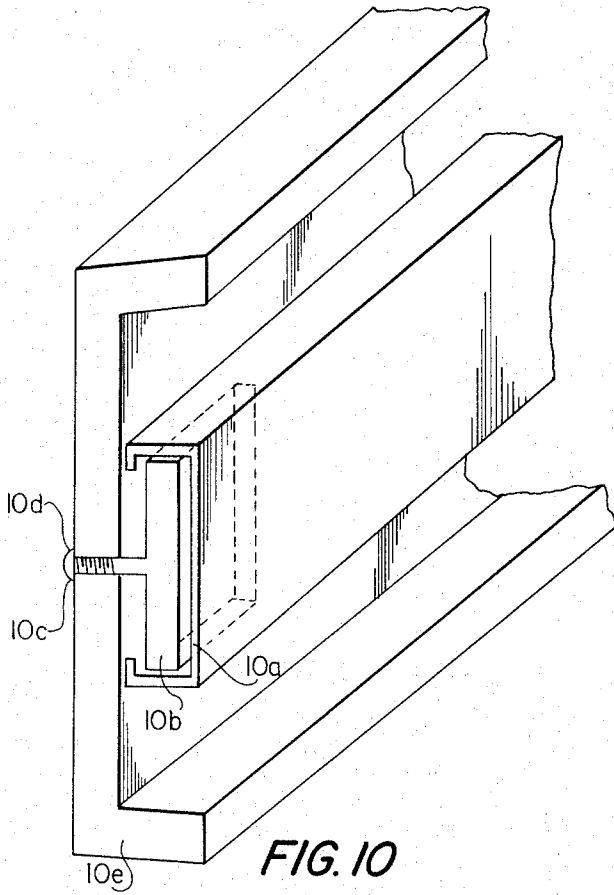


FIG. 10

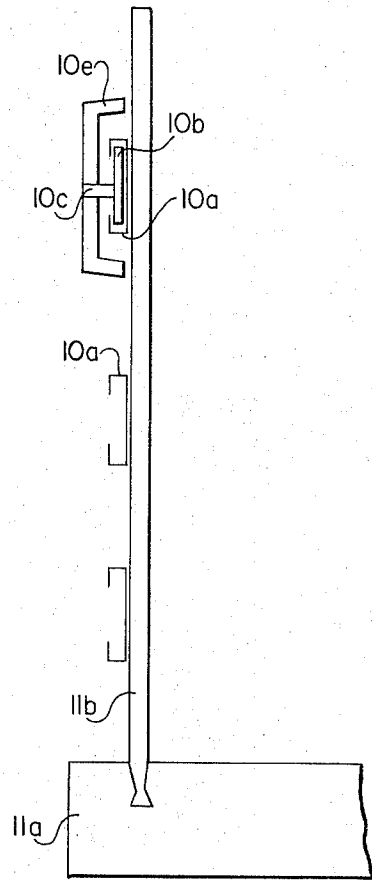


FIG. 11

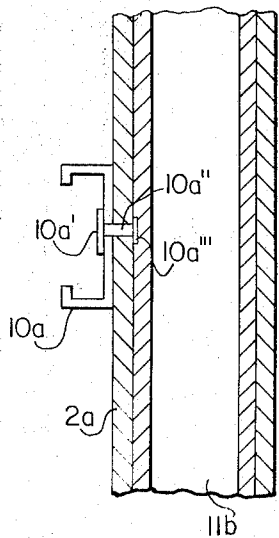


FIG. 11a

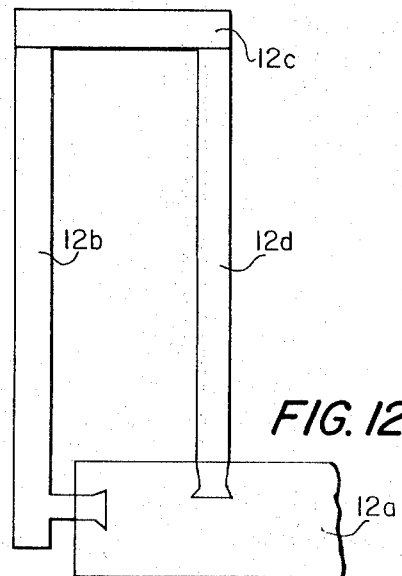


FIG. 12

CONSTRUCTION SET FOR THE PRODUCTION OF STRUTTING ARRANGEMENTS

BACKGROUND OF THE INVENTION

The present invention relates to a construction set for the production of strutting arrangements, which preferably has a skeleton-like character and which can be used for the production of supports, supporting constructions, frame constructions connecting arrangements, scaffoldings, reinforcing arrangements, suspension arrangements and the like. A particular characteristic of the construction set according to the invention is that its individual elements can be connected by plug connections and possibly without a bore hole by screw connections, whereby no limits are set to the user of this construction set with regard to the possibilities of variation. A further general and important characteristic of this construction set according to the invention consists in that the individual elements can be combined with one another with the use of inside grooved profiles by insertion of angular connecting parts, whereby this also comprises connecting parts with so-called rounded edges. In this way the greatest possible variability of use and fields of application of the construction set according to the invention is possible.

According to a further, preferred embodiment a clamp connection of individual elements is used beside the plug connection. Furthermore, according to a further embodiment an adhesive connection of individual elements can also be provided.

The construction set according to the invention for the production of strutting arrangements is well suited, for example, for the production of skeleton structures for balconies, which possibly also carry sheathing for the balcony. The result of combining the individual elements is a completely covered skeleton for a balcony.

The essence of the invention will now be explained in detail on the basis of the attached drawings which illustrate the covered balcony skeleton by way of example.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front view of the base element partially in section;

FIG. 2 is a side view of the base element partially in section;

FIG. 3 is a perspective view of a portion of the central bar;

FIG. 4 is a sectional view of the upper end of the central bar;

FIG. 4a is a top view of the upper end of the central bar;

FIG. 5 is a sectional view of the hand rail in section;

FIG. 6 is a top view of the corner piece;

FIG. 7 is a side view of the corner piece;

FIG. 8 is a side view partially in section of the transverse connection between the central bars;

FIG. 9 is a side view partially in section of the angle connection between the central bars;

FIG. 10 is a perspective view of the C profile-like strip connection between the central bars;

FIG. 11 is a schematic diagram illustrating assembly of the components of FIG. 10.

FIG. 11a is a side view illustrating attaching the C profile-like strip to central bar;

FIG. 12 is a schematic view illustrating further construction set variation;

FIG. 13 is a schematic view illustrating further construction set variation; and

FIG. 14 is a schematic view illustrating further construction set variation.

DESCRIPTION OF THE PREFERRED EMBODIMENT

According to the invention this task will be solved through a construction set of strutting arrangement elements, which in the case of this example are to be defined as balcony sheathing elements, which elements can be combined or put together logically into a balcony sheathing or covering.

These balcony sheathing elements according to the invention contain both the actual sheathing frame or skeleton and the equipment of this framework with dressing elements, which are known per se, and which have particularly the form of facing panels, made of weather resistant material.

A further aspect of the present invention consists in that the individual elements of the construction set for the production of balcony facings consist of an easily moldable or castable material, particularly of aluminum castings.

The embodiment of the invention, described above and given by way of example, will now be explained in detail on the basis of the attached FIGS. 1 to 14, representing the preferred embodiment.

FIG. 1 shows the so-called base element 1, which is divided essentially into the lower part 1c, to be sunk into the cantilever, the base plate 1b of the floor and the upper part 1a. The lower part 1c is also called the base support.

The FIGS. 1 and 2 each show perpendicular sections through the base element, whereby the sectional planes stand perpendicularly one on top of the other.

FIG. 3 shows in perspective and broken away at one end the so-called central bar 2 which is slipped on the upper part 1a of the base element and which is connected there by screw connection or by adhesive connection in one piece with the base element 1. According to a preferred embodiment, the upper part 1a of the base element 1 has the shape of a cut stone which has guide ribs at its four corners which are guided in the correspondingly developed corners 2b, 2b', 2b'' and 2b''' of the central bar 2.

On the upper end of the central bar 2, the upper closing element 3 is seated, which is shown in the FIGS. 4 and 4a in section and in top view.

The lower part 3a of this closing element corresponds in its geometry to the upper part 1a of the base element. Connected in one piece, this lower part 3a is succeeded by a closing plate 3b arranged at a right angle to it, which plate has bores 3c for the reception of the handrail. This handrail, shown in FIG. 5 in section, has reference number 4. Screw elements 4a can be provided, for example, for a screw connection.

As can be clearly seen from FIG. 3, the central bar 2 has an octagonal cross section, whereby, as has been explained already, the two shorter opposite sides have guide ribs in each case as the result of an undercutting arrangement. As a result of these guide ribs, one can also define this central bar 2 as a profile with inside

grooves. As a result of this type of arrangement of the undercuttings not only these desirable inside grooves or guide ribs develop, but in the inside of the central bar there develops, at the same time, the so-called guide corners $2b$, $2b'$, $2b''$, and $2b'''$, which are of importance for safe guidance of the correspondingly structured elements to be inserted into the central bar. An additional function of these inside grooves will be described further on. As can further be seen from FIG. 3, at least in one inside groove a rubber or plastic decorative strip $2a'$ is disposed, as a result of which an esthetic effect is achieved while also functioning to guard against injuries.

For a right angle deflection of the handrail 4, for example, the so-called corner piece 5, disclosed in the FIGS. 6 and 7, is a constituent part of this construction set according to the invention, which has anchoring elements $5b$ which cooperate with the correspondingly dimensioned and structured underside of the handrail 4a.

In FIG. 8 another important element of the present invention is disclosed, namely, the transverse connection 8 between two central bars, which are not shown in FIG. 8. The elements $8a$ and $8b$ correspond in their structure and geometry to the upper part $1a$ of the base element 1, that is, they are introduced into the central part from above and are anchored there in a manner known per se, whereby the central bar has the function of a sheathing. The two perpendicular anchoring elements $8a$ and $8b$ of the connecting bar 8 are connected in one piece with the actual, horizontally lying bar element $8c$ which has been created and is suitable as a support for the handrail.

Another essential element of the construction set according to the invention for strutting arrangements is shown in FIG. 9. Here, we are dealing with an angle element which is used whenever the balcony sheathing is to be arranged in front of the edge of the cantilever. In this case, a properly dimensioned hole is made in the front wall of the cantilever in which the anchoring element $9b$ is then inserted or preferably cemented which at its lower end has a type of barb structured element $9a$. The closing plate $9e$ constitutes the closure with the cantilever front side which is then succeeded by a block-like element $9c$ on which is placed the upper part $9d$ at right angles to the axis of the anchoring part $9b$ which upper part serves for the reception of the central bar which is suitably structured for the reception in the central bar, which again functions as a sheathing.

In FIG. 10 another essential combination of elements of the construction set according to the invention for the production of strutting arrangements has been disclosed; this combination of elements consists of a C profile-like strip $10a$, which, in a novel manner, connects central base of the overall combination according to the invention in any number and in any desired arrangement as to height. In this C profile-like strip a correspondingly dimensioned, preferably square, supporting plate $10b$ has been disposed, which has on its front-side a screw connection element $10c$, for example, with grub screw closure $10d$. This screw coupling element $10c$ likewise holds C profile-like balcony facing strips or facing plates $10e$. These balcony facing strips or facing plates frequently consist of a material with a high heat expansion coefficient. A surprising progress achieved with the present invention is that thermal adjustment of length can take place without difficulty

through the fact that the holding plate $10b$ travels in the C profile of the strip $10a$, that is, it can travel glidingly to the left or to the right depending on the heat expansion or cold construction of the material of the facing strip $10e$.

FIG. 11 shows the assembly of the combination of parts presented in FIG. 10. The balcony plate $11a$ carries the combination of the base element and central bar 2, designated by reference numeral $11b$ whereby the C profile-like strips $10a$ are attached to the central bar, for example, are screwed together, and, then, the arrangement is made for the attachment of the facing strip $10e$, which has been drawn in detail in FIG. 10.

FIG. 11a shows in somewhat larger scale a preferred embodiment of the attachment of the C profile-like strip $10a$ to the central bar $11b$. As was explained above, the central bar according to a preferred embodiment has inside grooves which have been designated in FIG. 3 with the reference numeral $2a$. In one of these inside grooves runs a screw $10a''$ with its head $10a'''$ facing the inside of the central bar which cooperates with a counterscrew $10a'$ in the manner shown in FIG. 11a so that upon tightening of the counterscrew $10a'$ one will achieve a jamming or tie up of the C profile-like strip $10a$ at any desired height without the need for any kind of borehole arrangement.

FIG. 12 shows a further variation of the construction set according to the invention whereby for the purpose of increasing the stabilization of the sheathing construction the construction arrangement $12b$, which has been disposed with the use of a construction element of the FIG. 9, has been supported in a reinforcing manner via a connecting element $12c$ which consists essentially of the connecting bar 8 shown in FIG. 8, by the combination $12d$ of central bar and base element.

FIG. 13 illustrates this reinforced support in the same manner with the variation that the front and rear central bar, lower part constructions $13b$ and $13e$, which are seated in the balcony floor plate $13a$ and connected by the connecting bar $13c$, are both inserted from above into this plate.

FIG. 14 shows a further method of application of the construction set according to the invention for strutting arrangements, from which one can see moreover, that the use of this total combination or sub-combination suitable for balcony sheathings, can also be used in other building areas, for example, for the construction of high-grade garden fences. In FIG. 14, the reference number $14a$ designates the ground pedestal at the end of a piece of ground on which the combination $14b$ lower part—central bar has been arranged from above, the corner piece—central bar combination $14b$ has been arranged from the side, whereby these two perpendicular elements have been connected by the connecting bar which in FIG. 14 is designated by reference numeral $14c$ and which has already been explained in detail in connection with the FIG. 8.

I claim:

1. A construction set, comprising:
 - a plurality of base elements, each of said elements being provided with an upper portion having guide ribs and an intermediate plate;
 - a plurality of bars spaced apart from each other, each of said bars being hollow, the bottoms of said bars being fitted over said upper portions of said base elements such that the bottom ends of said bars abut said plates of said base element;

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a plurality of closing elements, each of said closing elements being provided with a lower portion having guide ribs and an upper plate, the tops of said bars being fitted over said lower portions of said closing elements such that the top ends of said bars abut said plates of said closing elements, said plates being provided with openings;

a hand rail, said hand rail being provided with a plurality of slots along the bottom thereof, at least one fastening assembly slidably mounted within one of said slots and passing through one of said openings within one of said plates of said closing elements;

a plurality of strips running transversely of said bars, each of said strips being generally C-shaped in cross section and comprising a back portion abutting said bars, arms extending outwardly from said back portion, said arms terminating in inwardly directed flanges, means connecting said strips to said bars, at least one supporting plate positioned within each of said strips, said supporting plate having end portions positioned within the enclosed areas defined by said back portion, arms and flanges of said strips permitting said plate to slide within said strip;

and

a plurality of facing plates aligned with said strips and means connecting said facing plates to said supporting plates comprising screws passing through

said facing plates into said supporting plates.

2. A construction set as in claim 1, wherein said base elements further include a lower portion located below said intermediate plate, said lower portion positioned below a walking surface such that said intermediate plate abuts same.

3. A construction set as in claim 1, wherein each of said bars is octagonal in cross-section.

4. A construction set as in claim 1, including at least one curved hand rail section provided at each end thereof with a plurality of fingers complimentary in configuration with respect to said slots formed along the bottom of said hand rail permitting said curved hand rail section to be fitted in place adjacent said hand rail.

5. A construction set as in claim 1, wherein each of said bars includes a slotted portion extending along the side thereof and adjacent said back portions of said strips and said means connecting said strips to said bars comprises a fastener positioned within said slotted portion of each of said bars permitting said fastener to slide therein, said fastener being connected to each of said strips.

6. A construction set as in claim 5, wherein said bars further include second portions running longitudinally therewith and decorative panels slidably mounted within said second slotted portions of said bars.

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