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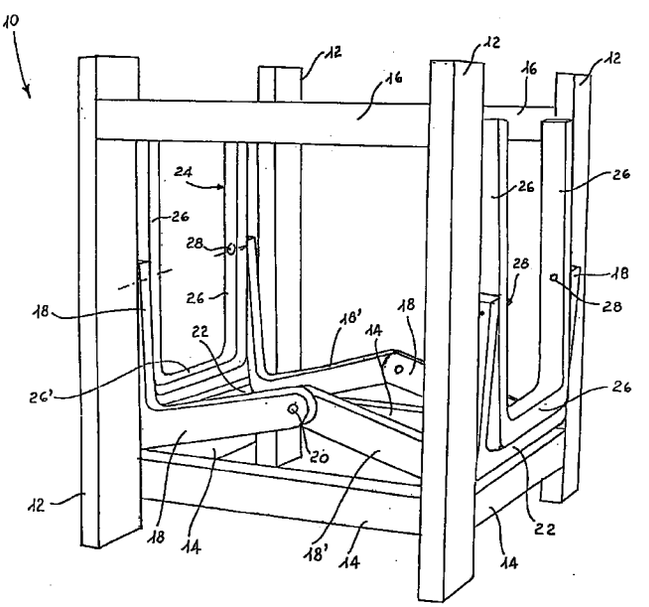
(54) Container with self-locking arms, especially suitable for rolling stock

(57) A container with self-locking arms, especially suitable for rolling stock, is constituted by a metal frame (10), made up by standards (12) connected to one another by lower (14) and upper (16) cross-pieces, provided with two couples of lever arms (18), (18'), articulatable connected, whose fulcrum is on the inner front of said couples. To the vertical branches of each of the arm couples (18), (18'), which are substantially "L"-shaped, a"U"-shaped frame circumscribed by said branches is articulatably connected.

FIG. 1



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Description

This invention relates to a container with self-locking arms, especially suitable for rolling stock.

More particularly, this invention relates to a container with self-locking arms, for the packing, transportation and storing of rolling stock especially tyres of railroad cars, tyre-centres and monobloc wheels.

As is known, because of the volume and weight of the components, the handling of railroad wheel arrangement requires specific interventions, suitable to prevent damages following the accidental and frequent shiftings of the load. Especially in relation with tyres, tyre-centres and monobloc wheels of railroad cars, it is necessary to provide packings such as to ensure as much as possible the stability and compactness of the many grouped components, usually transported by sea or railroad shipping from the production plants to the different destinations.

For this purpose, said wheels, tyres and tyre-centres are superposed in variable number on pallets or beds of a traditional type and then steel strapped, i.e. tied to the supporting frame by means of metal straps. This traditional solution involves some severe drawbacks.

First of all, the steel straps utilized do not prevent the shifting of the superposed elements in case of abrupts strains which happen often during transportation; as a consequence, the superposed monobloc wheels, tyres and tyre-centres, tend to move away from one another in a disorderly way, and in the worst cases, they break the straps, sliding on the floor and suffering damages. Therefore, on unloading the material, it is necessary to re-compact the group of components, which is obviosuly difficult because of the weight, and time wasting.

Also in the stage of preparation of the bed for the shipment, the operation of arranging the whole involves marked difficulties, as wheels, tyres or tyre-centres must be superposed with a precise alignment, and therefore constrained by said steel straps.

Object of this invention is to obviate the aforementioned drawbacks.

More particularly, object of this invention is to provide a container for rolling stock such as not to require binding operations of the material, and allowing, during the transportation, the exact keeping of the original position even in case of abrupt strains.

A further object of the invention is to provide users with a container as defined above, suitable to automatically lock the rolling stock placed on the same.

A further object of the invention is to provide a container for rolling stock suitable to ensure a high level of resistance and reliability in the long run, and also such as to be easily and economically realizable.

These and still further aims are reached by the container with self-locking arms, especially suitable for rolling stock subject matter of this invention, basically characterized in that it is constituted by a metal frame, made up by standards connected by lower and upper cross-pieces, provided with four lever arms, connected by pairs to one another, and whose fulcrum is on the inner front of each of said standards, the arms being substantially "L"-shaped.

The construction and functional characteristics of the container with self-locking arms for rolling stock subject matter of this invention shall be better highlighted by the following detailed description of a preferred non limitative embodiment of the same, made with reference to the attached drawings, wherein:

Fig. 1 shows schematically a perspective view of the container with self-locking arms, subject matter of the invention;

Fig. 2 is a schematic front view of the container, limitedly to a couple of leverages and locking arms which act on the loaded elements;

Fig. 3 is a schematic side view of the container wherein the rolling stock is placed.

With starting reference to Fig. 1, the container with self-locking arms for rolling stock is basically constituted by a metal frame indicated on the whole by 10, having a hexagonal plan by way of example, made up by vertical standards 12 connected by coss-pieces 14, horizontally arranged near the floor supporting point of said standards. Further cross-pieces 16 connect, in the upper part, two couples of opposite standards 12. The aforementioned standards and cross-pieces, preferably made from quadrangular iron sections connected to one another by means of welding, circumscribe a container of a substantially parallelepipedal shape.

Frame 10 is provided with four metal lever arms 18, 18', connected in pairs, which circumscribe a toggle device developed in the inside of the frame. More particularly, each of the arms 18, 18' is constituted by a substantially "L"-shaped element from steel or other suitable material having a section quadrangular by way of example, connected to the internal wall of one of standards 12; the end of the horizontal branch of each arm 18, 18' is connected, with pins or bolts 20, to the corresponding end of the opposite arm by whose side it rests. The aforementioned arms are placed in correspondence of the inner front of standards 12, which are not connected to one another on the top, and which develop preferably with their vertical branch from about mid-height of said standards until they almost reach standards 14.

Each couple of arms 18, 18' has a further connecting cross-piece 22, tied by welding or equivalent means to the lower end of the vertical branch of said arms. Said connecting element is parallel relatively to the underlying cross-piece 14 of frame 10, and is spaced from it by a length comprised, by way of example, between 15 and 30 mm. The opposite fronts of cross-piece 22 are provided with seats for fitting pins 28' or equivalent means for connecting to standard 12.

Between the vertical branches of each couple of arms 18, 18', a "U"-shaped metal frame 24 is located; the vertical branches 26 of said frame brush the inner front of arms 18, 18' in correspondence of their upper branch to which they are connected by means of bolts

28 or equivalent means. The vertical branches 26 of the same "U"-shaped frames have preferably a double length compared to the vertical branches of arms 18, 18', reaching a sligthly lower level compared with the upper end of standards 12; the horizontal branch 26' of said frames 24 is spaced by a length comprised, by way of example, between 20 and 40 mm from cross-piece 22 connecting arms 18, 18', in order to be able to oscillate freely relatively to the same.

Standards 12 and the horizontal branches of arms 18, 18' are preferably connected by elastic means (not shown), such as for instance springs or the like; said means allow, as stressed in particular in Fig. 1, to keep the horizontal branches of said arms angularly oriented upwards, in the absence of loads placed in frame 10. In these conditions, the vertical branches of arms 18, 18' may slighltly protrude towards the inside relatively to standards 12, as shown by the diagram of Fig. 1; however, a preferred solution provides for the arrangement of specific catches on the standards, to prevent arms from protruding from the same.

Altogether, arms 18, 18' constitute an oscillating support for the load to be placed in the container, made up by frame 10 and are stressed the moment the load rests on them, as we shall specify in detail in the following with reference to Figs. 2 and 3.

Fig. 2 shows schematically the arrangement assumed by a couple of arms 18, 18' and a "U"-shaped frame when rolling stock, for instance monobloc wheels 30 for railroad cars, are placed in the container subject matter of the invention. Said monobloc wheels, oriented with a vertical axis, are aligned to one another and arranged by groups in frame 10, transversally relatively to arms 18, 18', whose horizontal branches, under the action of the weight, are caused to lower in the direction of cross-pieces 14, overcoming the resistance of the springs or like elastic means which connect them to standards 12.

The lowering of the aforementioned branches is automatically limited by the whole length of the groups of monobloc wheels 30, whose number is comprised between 4 and 6, depending on their thickness; the external front of the first and last of them is actually directly catched by the vertical branches of arms 18, 18', which oscillate in the direction of the centre of frame 10.

The opposite "U"-shaped frames 24, articulatably connected in correspondence of the end of the vertical branches of said arms, oscillate in their turn in the same direction and approach the monobloc wheels, circumscribing their exposed front also in the upper portion, acting therefore as a restraining barrier. This condition is schematically shown in Fig. 3.

Said monobloc wheels are traditionally provided with a central hole 30', within which a temporary supporting shaft is advantageously provided; hence, a plurality of wheels 30 can be fitted on said shaft which, protruding from the opposite ends of the group of artifacts approached to one another, constitutes the suitable grip point for the whole of wheels which are simultaneously handled by hoists or lifting trucks, and placed blockwise in frame 10.

As can be understood from the above, the invention achieves many advantages.

The container with self-locking arms subject matter of this invention allows to group and keep in constant barycentric position the monobloc wheels, the tyres or the tyre-centres of railroad cars; the same container is advantageously utilizable during the working of said artifacts, acting as a small storehouse for temporary storing.

The material circumscribed by the arms and the "U"-shaped frames of the container is not subject to slidings and ensuing possible dents, and does not require further steel strapping operations.

The loaded containers are easily transportable, as the base cross-pieces are spaced from the supporting plane and allow the insertion of the forks of the lifting trucks.

However, the invention, as described hereabove and claimed hereafter has been proposed by way of example only, being understud that the same may be subject to many changes and variants, all of them falling within the scope of the invention.

For instance, the container may be provided, especially along the standards, with openings no matter how shaped for hooking ropes or chains allowing the handling with overhead cranes, or it may have supporting plates on the upper end of said standards or seats suitably shaped for their superimposition.

While it has been proposed in particular for the transportation of rolling stock, the container subject matter of the invention can be used also for other purposes, and house, for instance, with the suitable sizings, coiled metal strips or other artifacts and materials for which an exact locking is required during handling.

Lastly, possible structural reversals or alternative placings of the components which form altogether the container subject matter of the invention are also possible.

Claims

1. A container with self-locking arms, especially suitable for rolling stock, characterized in that it is constituted by a metal frame (10), made up by standards (12) connected by lower (12) and upper (14) cross-pieces, provided with at least a couple of lever arms (18), (18'), articulatably connected (20) to one another and whose fulcrum is on the inner front of each of said standards, arms (18), (18') being substantially "L"-shaped.

2. A container according to claim 1, characterized in that the end of the horizontal branch of each arm (18), (18') is connected, by means of pins and/or bolts (20), to the corresponding end of the opposite arm, which end it approches sideways, and the vertical branch develops from about mid-height of

standards (12) until it almost reaches the lower cross-pieces (14).

3. A container according to the preceding claims, characterized in that it has two couples of arms (18), (18'), provided each with a connection cross-piece (22) tied by welding or equivalent means to the lower end of the vertical arm, from which a pin (28') protrudes which fits in the the inner front of standard(s) (12).

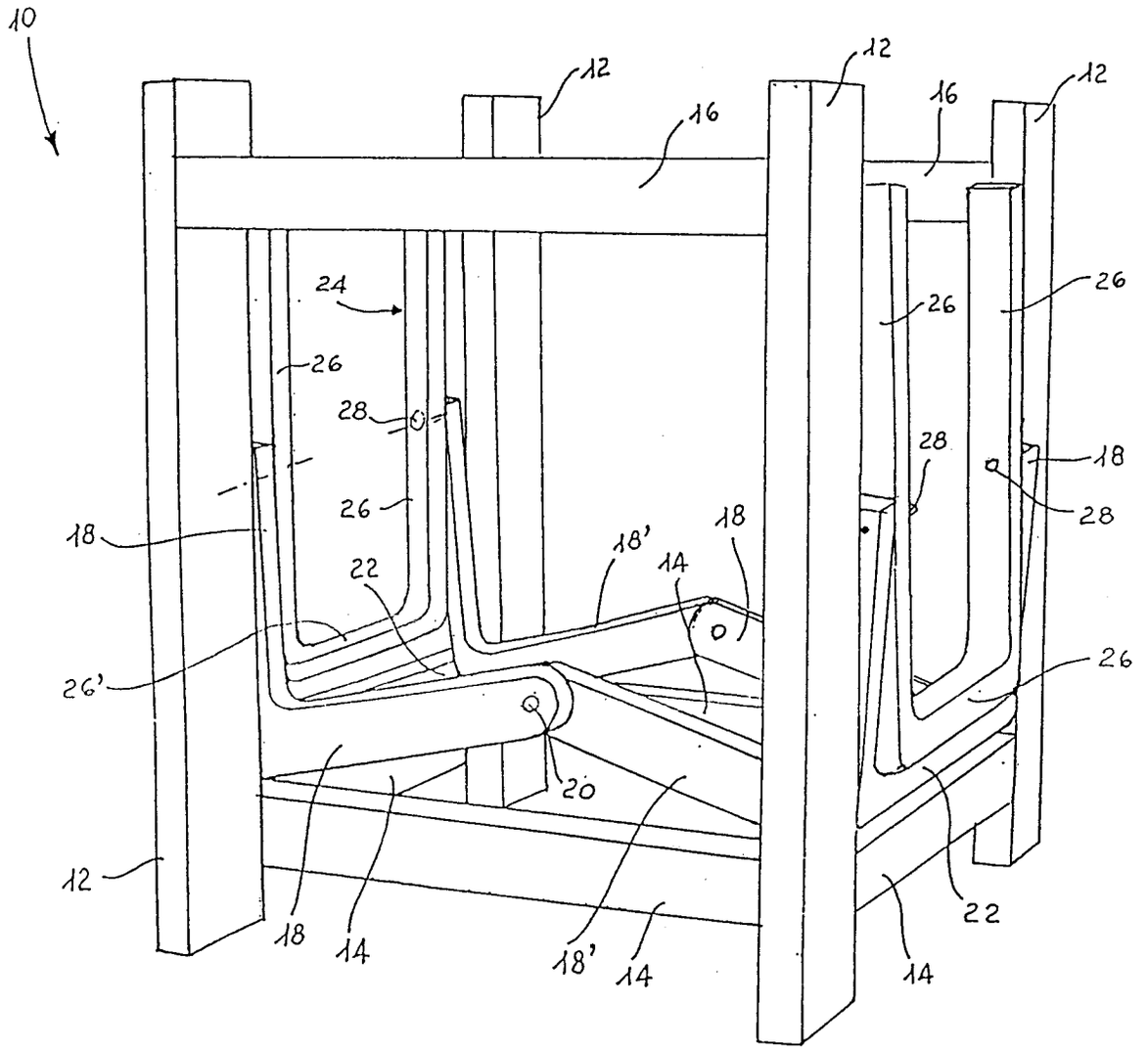
4. A container according to the preceding claims, characterized in that between the vertical branches of each couple of arms (18), (18') a substantially "U"-shaped frame is provided, whose vertical branches brush the inner walls of said arms to which they are articulatably connected with bolts (28), pins and/or the like.

5. A container according to one or more of the preceding claims, characterized in that the length of the vertical branches (26) of the "U"-shaped frames is almost twice the length of arms (18), (18'), the horizontal branch (26') of said frames (24) being spaced from the cross-piece (22) connecting said arms to be in condition of freely oscillating relatively to said cross-piece.

6. A container according to one or more of the preceding claims, characterized in that standards (12) and the horizontal branches of arms (18), (18') are connected by elastic means which keep said branches angularly oriented upwards, in the absence of loads within the frame.

7. A container with self-locking arms, especially suitable for rolling stock, as described with special reference to the reservation expressed in the last period of the descriptive part, illustrated by way of example and for the purposes specified.

FIG. 1



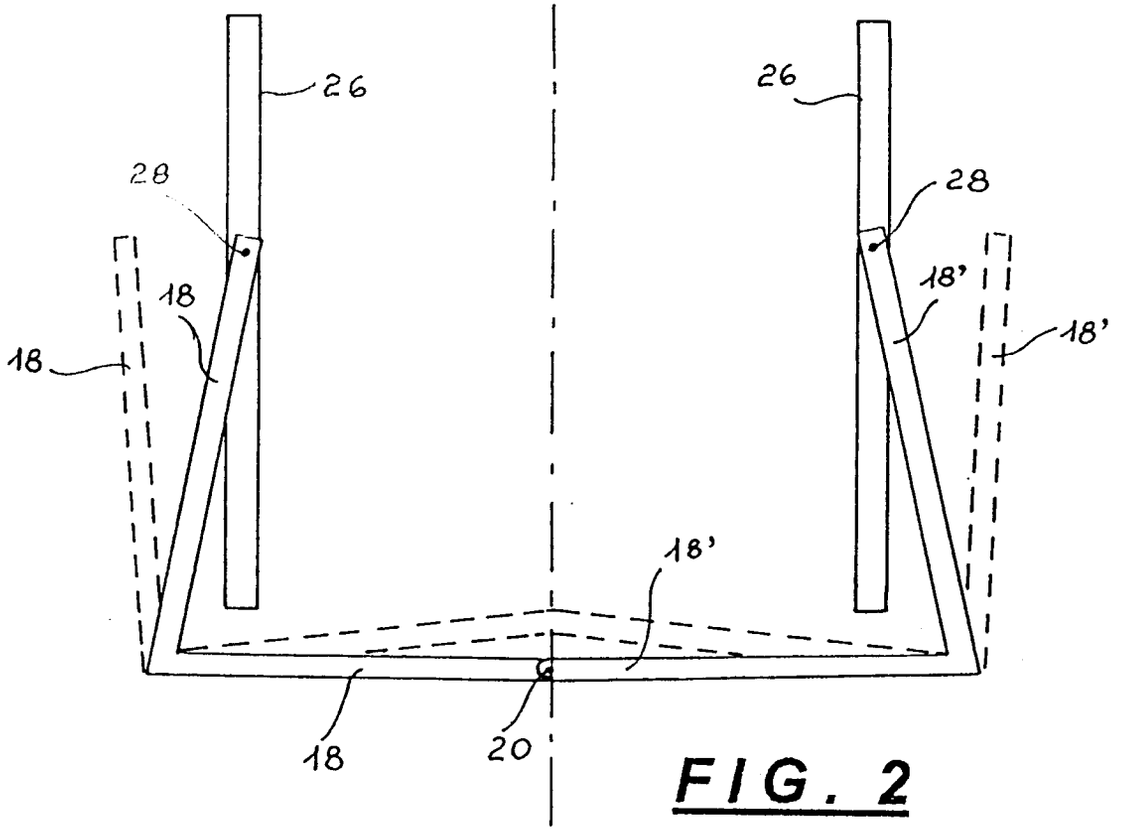

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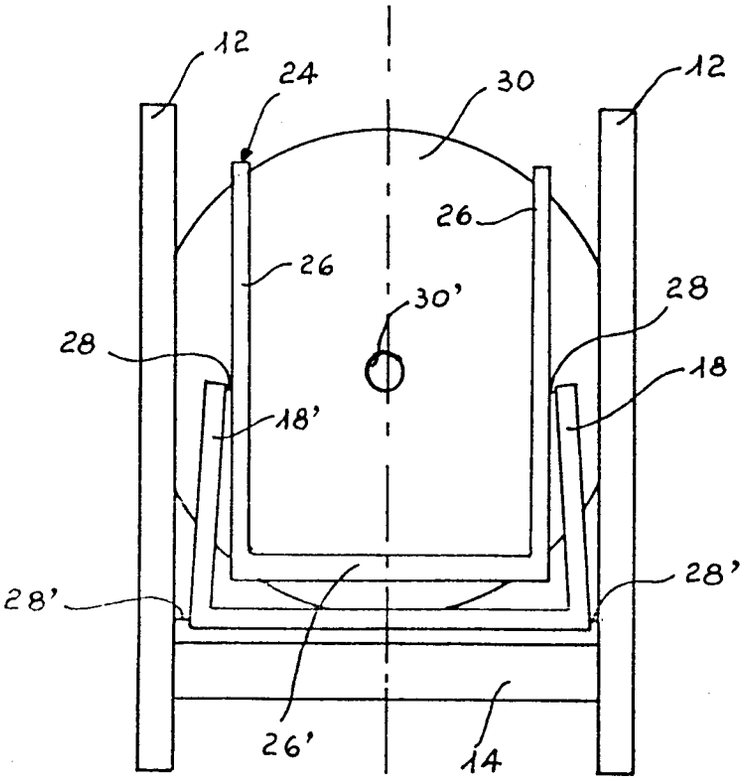
FIG. 2


12
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18'
28'
28'
26'
14

FIG. 3