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[54] **ARTICLE-SECURING DEVICE**
6 Claims, 5 Drawing Figs.

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296/35
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105/366, 366.4; 296/35.1

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ABSTRACT: A device for holding a container or the like to a mounting base of a supporting base, located within another container, for example, includes a bolt member which is mounted for rotation on the base plate and which may be operated by a hand lever extending outwardly therefrom. The upper end of the bolt is provided with a widened head portion of oblong configuration having a long end which is normally oriented so that it will align with a long end of a socket or receiving member which is defined at the lower end of the container or article to be anchored. The head portion advantageously comprises two parts including an upper head and a lower disc shaped part having end faces which are congruent to the underside of the upper part. The lower part is advantageously rotatably mounted on the pin but includes a surface which frictionally engages the pin. Rotation of the hand lever after the oblong outline of the head portion is aligned with the receiving slot of the socket of the article to be fixed will pivot the bolt with the oblong head within the socket receiving portion so that the oblong portion extends across the receiving slot and anchors the article to the supporting base. The lower part of the head will pivot with the bolt only if the wall bordering the socket slot is thin enough so that it will not block its pivoting. If the wall is thicker it will block the lower part so that only the upper part will move with the bolt.

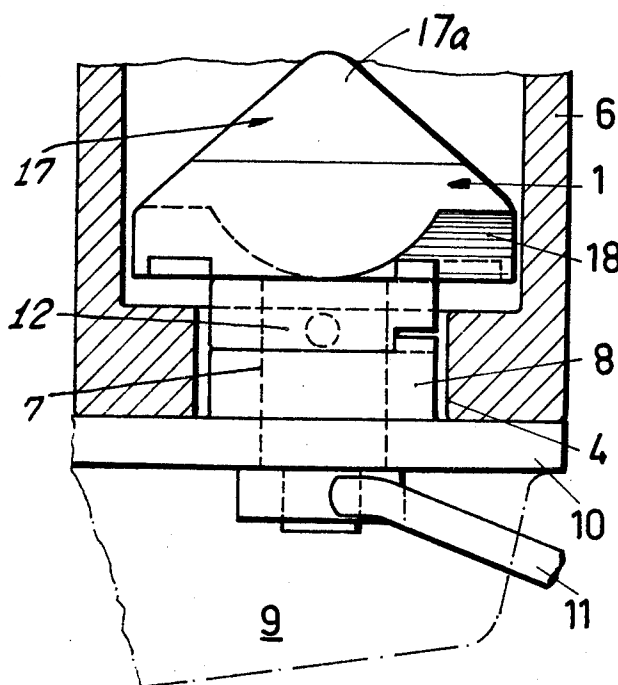


Fig.1

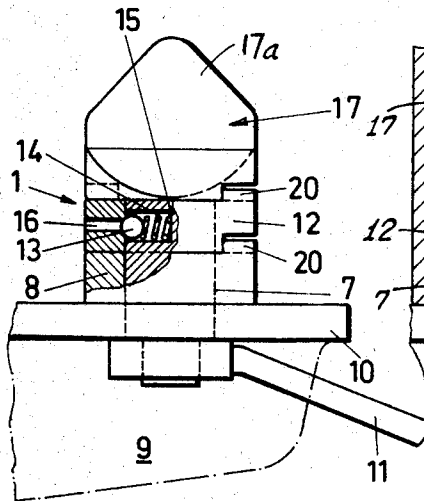


Fig.2

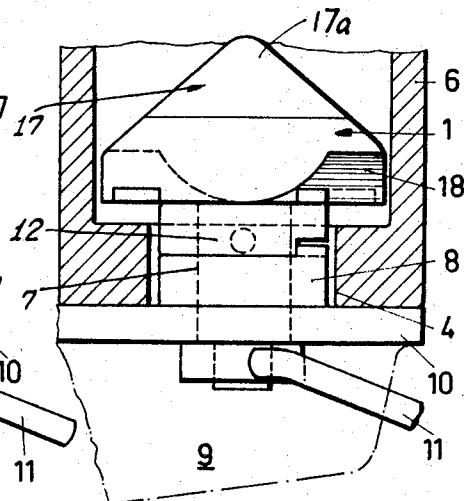


Fig.3

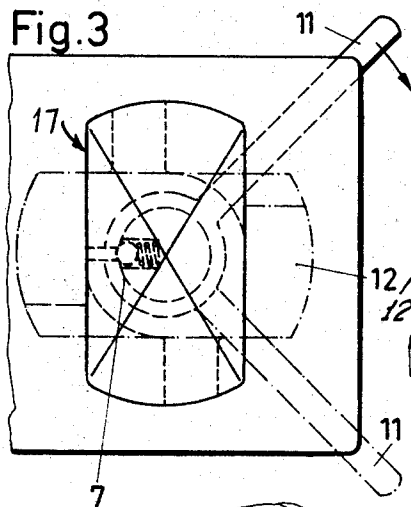


Fig.4

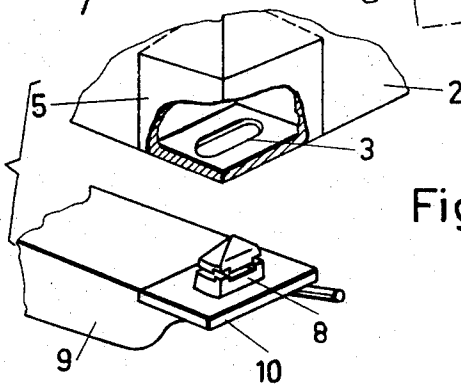
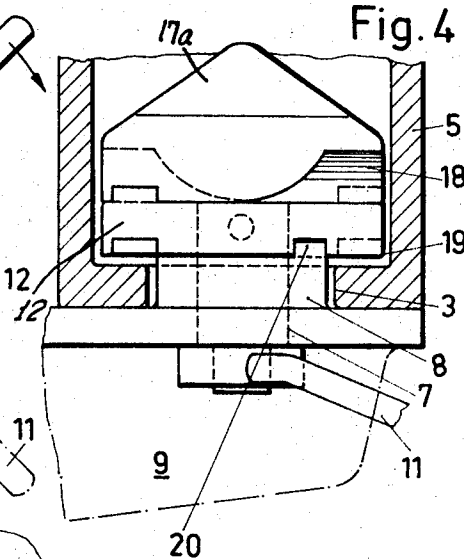


Fig.5

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ARTICLE-SECURING DEVICE

SUMMARY OF THE INVENTION

This invention relates in general to the construction of devices for securing articles to a receiving platform or base, and in particular, to a new and useful rotatable bolt device which includes a head portion which is adapted to project upwardly from a receiving base and which is of a configuration to pass through an oblong receiving socket, and including a lever member attached to the bolt for rotating the head portion to position it across the slot of the receiving socket to hold the article to the supporting base.

The present invention is particularly applicable for securing articles such as containers to a baseplate. With devices of this nature it is usual to provide a rotatable part such as a bolt which includes an oblong upper extension or head which may be positioned into an oblong receiving slot of the article or container to be anchored and then rotated so that the oblong head portion will be positioned across the slot and thus hold the part to the baseplate. With arrangements of this nature it is necessary to manufacture the oblong head and the bolt so that the head will be dimensioned above the supporting base at a height which corresponds to the thickness of the wall of the receiving sockets of the articles which are to be supported. However, there are containers in use which have standardized securing socket inserts of two different wall thicknesses. If, as would be desirable for reasons of economy, a single-bolt-type construction is employed, the height of the lower end of the oblong head above the base must be at least sufficient so that when the head is rotated it would clear the walls of all of the known sockets which are to be employed. This would have the disadvantage, however, that when the bolthead is used to cooperate with a socket having a relatively thin wall and which requires only a short height of the head that the container would not be held on the supporting base firmly but would wobble in its secured position.

In accordance with the present invention, there is provided an improved construction of securing device which includes a rotatable bolt which may be actuated by a lever extending outwardly therefrom and which carries an oblong head portion which projects upwardly above a securing base. The construction includes a head portion of two parts including an upper part and a disc-shaped lower part having end faces which are congruent with the underside of the upper part and which is rotatably mounted on the pin but has a frictional contact therewith. The disc thickness therefor corresponds to the difference in thickness of the receiving socket plates of the two common standardized container socket elements. When the device is used with socket having a thin wall the upper head portion will rotate with the bolt along with the lower disc portion due to the frictional contact of the lower disc portion with the pin and thus the upper and lower portions will remain in their congruent relationship and the oblong upper head portion will engage across a slot of the receiving socket at the desired height corresponding to the thickness of the wall of the receiving socket. In the case of the thin wall socket the entire head portion including the upper and lower portions will engage over the thin wall of the socket and hold the article without wobble to the base plate.

In the case of a receiving socket which has a relatively thick wall the lower portion of the head is blocked by the wall of the receiving socket and thus cannot rotate with the upper portion of the head so that there is a relative sliding movement between the upper and the lower portions and only the upper portions of the head pivots with the bolt and this portion alone engages over the thick wall of the receiving socket and thus holds the article to the base without any wobble.

In accordance with a further development of the invention, the lower portion is frictionally engaged with the rotatable pin or bolt by means of a coil spring acting against wall which bears between the lower portion of the head and the bolt at

the location of a receiving detent or recess. In addition, the undersides of the lower and upper portions of the head advantageously include inclined or oblique surfaces which permit relative runup of the upper portion relative on the article-receiving slot wall and ensures wedge locking of the container socket to the base even through the socket is not positioned flush against the mounting base of the carrier, for example, in the case where the mounting base or the receiving container is warped due to rough handling.

This invention is an improvement over the rotating-bolt-type clamping device which includes a spiral compression spring which operates in cooperation with wedge inclines. In the prior art construction the compression spring must transmit the holding force to the container and it must be designed relatively large and strong to accomplish this task. The matching wedge inclines are located under the base plate. This makes the axial installed length of the known rotating bolt arrangements greater than the installation dimension usually available under a vehicle frame carrier. In addition, it is difficult to actuate such devices than it is to turn the actuating lever.

With the present invention it is possible to provide a very easy operation of the actuating bolt by forming the baseplate of an inner and outer part. Such parts will form a prismatic guide in relation to each other with a guide profile which is preferably tapered on the edge side. When the container is deposited each rotating bolt can automatically center itself without difficulty in the respective socket opening through which the head portion extends. The head portion is advantageously made of a roof-shaped configuration because the prismatic guide surfaces permits the centering movement of the head.

Accordingly, it is an object of the invention to provide an improved securing device for anchoring elements to a mounting base which includes a rotatable bolt element having a head portion which includes an upper portion and a lower portion having abutting surfaces which are congruent, the lower portion being frictionally engageable with the rotatable bolt and the upper portion being affixed thereto so that when the bolt is rotated both portions will normally rotate therewith but the lower portion may be blocked in those instances in which the receiving surface is sufficiently high so that engagement with the upper portion alone becomes desirable.

A further object of the invention is to provide a device for holding articles to a mounting base or other support which includes means for accommodating the holding device to the thickness of a wall of a receiving socket in order that the article may be held firmly without wobble regardless of the type of receiving socket which is employed.

A further object of the invention is to provide a securing device for holding articles to a supporting base which is simple in design, rugged in construction, and economical to manufacture.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there are illustrated and described preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a partial elevational and partial sectional view of a securing device constructed in accordance with the invention;

FIG. 2 is a partial elevational and partial transverse sectional view through the socket of an article to be supported on the base;

FIG. 3 is a partial top plan view of the article indicated in FIG. 2;

FIG. 4 is a view similar to FIG. 2, but with an article having a receiving socket of less thickness; and

FIG. 5 is a partial side perspective with a portion of the article broken away showing an article located above the mounting base therefore having the securing device.

GENERAL DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, in particular, the invention embodied therein comprises a securing device generally designated 1 which includes a pin 7 which is rotatably mounted in a baseplate 10 and which may be rotated by means of a lever 11 secured to a projection thereof at the underside of the baseplate in an excessible position on a frame carrier 9. The baseplate 10 includes a guide collar 8 which extends upwardly therefrom and surrounds the lower portion of the pin 7.

In accordance with the invention an oblong head generally designated 17 is carried on the pin 7 at the upper end thereof for rotation therewith. In accordance with a feature of the invention, the head 17 includes an upper portion 17a which is affixed to the pin for rotation therewith and lower portion or disc 12 which is frictionally engaged with the pin 7 and which may rotate therewith but which may be blocked against rotation so that it does not. In the embodiment shown, the frictional engagement of the disc 12 with the pin 7 is accomplished by a ball 13 which engages within a detent or blind hole 16 of the disc 12. The ball is carried in a hole of the pin 7 and it is urged outwardly by a spring 14 to engage in the detent recess 16 at a location at which the configuration of the disc 12 and the upper part 17a is aligned with the configuration of the lowermost guide collar 8 of the base 10.

The securing device 1 of the invention thus may be used to hold an article such as a container 2 which has a receiving socket 5 with a relatively thin wall at the location of an uptake 3 or with a socket 6 having a relatively thick wall at the location of an uptake 4 as shown in FIG. 2.

When a container 2 is to be mounted on a base 10 of a carrier frame 9 it is oriented as indicated in FIG. 5 such that a corner socket 5 thereof is located over the baseplate 10 and an oblong uptake slot 3, 4, thereof is oriented to align with the oblong head 17a, disc-shaped lower part 12, and guide collar 8. When the container 2 is lowered the head 1 moves through the uptake slot 3 or 4 in accordance with which of the sockets 5 or 6 is employed.

In the event of a thick wall uptake 4 the height of the wall of the uptake is great enough to prevent rotation of the disc-shaped lower part 12 of the head 17 so that only the upper part 17a rotates when the bolt or pin 7 is rotated by the movement of the lever 11. This means that the lower portion of the upper part 17a will move to a position at which it overlies the interior or top of the lower wall of the socket 6, and will thus hold the container to the base 10 without any wobble. The upper part 17a may be moved by rotating the lever 11 with little effort.

In the arrangement indicated in FIG. 4, when a socket 5 having a thin wall uptake 3 is employed, rotation of the bolt 7 by the lever 11 will cause frictional contact of the disc-shaped lower part 12 with the bolt and rotation along therewith so that the whole head portion including the upper part 17a and the lower part 12, is shifted to a position which it extends across the uptake slot 3. Thus the head 17 in the arrangement of FIG. 4, has a lower surface which actually is the surface of the disc portion 12 and which engages over the top of the lower wall at the uptake slot 3 of the socket 5 without any substantial play and holds the container 2 firmly in position even

though the wall of the uptake is relatively thin.

Should the container 2 be warped and therefore not stand snugly on the frame carrier 9 of the truck vehicle after it is lowered onto the frame carrier, then the socket 6 or the socket 5 whichever is used, may not normally rest directly against the base 10. Nevertheless, with the invention construction, the securing device 1 will firmly press the socket down to the frame carrier. This is accomplished by the runup incline 18 which is defined on the underside of the head portion 17a or by a similar incline 19 defined on the underside of the lower part 12. The inclines 18 and 19 are shaped such that the associated part of the head 17 will be permitted to gradually engage over the top of the wall adjacent the uptake slot 3 or 4 until a tight seating of the head part is effected and this will cause a gradual pulling down of the container onto the base 10.

In order to accommodate inaccuracies of the centering of the sockets the baseplate 10 is advantageously constructed so that it may be shifted in respect to the carrier 9 on a dovetailed guide (not shown). The pivoting of the head portion 17a and 12 back to an original position is facilitated by matching end abutments 20 defined on the ring collar 8 and the lower head part 12 which engage with opposite respective undercuts of the lower or upper head parts.

What I claim is:

1. A device for holding an article to a receiving base such as a container having a socket with a wall having an oblong receiving slot for holding the article to the base, comprising a bolt adapted to be rotatably mounted on the receiving base and to project upwardly therefrom, and an oblong head carried at the upper end of said bolt and including an upper portion affixed to said bolt for rotation therewith after it is positioned in the receiving slot of the container to engage across the top of the socket wall receiving slot, and a lower portion of predetermined thickness frictionally engaged with said bolt for rotation therewith to be position below the head portion across the socket-wall-receiving slot but being capable of being blocked by the wall of those receiving slots over predetermined thickness so that it will not be rotated with said bolt in which event the upper head portion along will engage across the top of the socket-wall-receiving slot.

2. A device, according to claim 1, herein said frictional engagement of said lower head portion with said bolt includes a ball ratchet bearing between said lower portion and said bolt and a detent receiving said wall, and spring means urging said ball into said detent for frictionally holding said lower portion to said bolt for rotation therewith.

3. A device, according to claim 1, wherein said upper portion and said lower portions of said head includes an undersurface at least one of which has an oblique portion defining a runup surface permitting wedging engagement of said undersurface over the socket wall defining the oblong slot of the receiving socket of the container.

4. A device, according to claim 1, including a socket adapted to be connected to an article to be secured to the base having an oblong slot therethrough, said slot being defined in a wall of said socket of predetermined thickness.

5. A device, according to claim 4, wherein said wall of predetermined thickness is of a height such that it extends above the base sufficiently to engage said lower portion and hold said lower portion against rotation with said bolt.

6. A device, according to claim 4, wherein said wall of predetermined thickness is such that it is lower than the bottom of the lower portion of said head above said base.