Jan. 16, 1951 E. C. ELSNER 2,538,641

QUICK-RELEASE AUTOMATIC STRAP BUCKLE

Filed Aug. 11, 1947

Fig. 1.

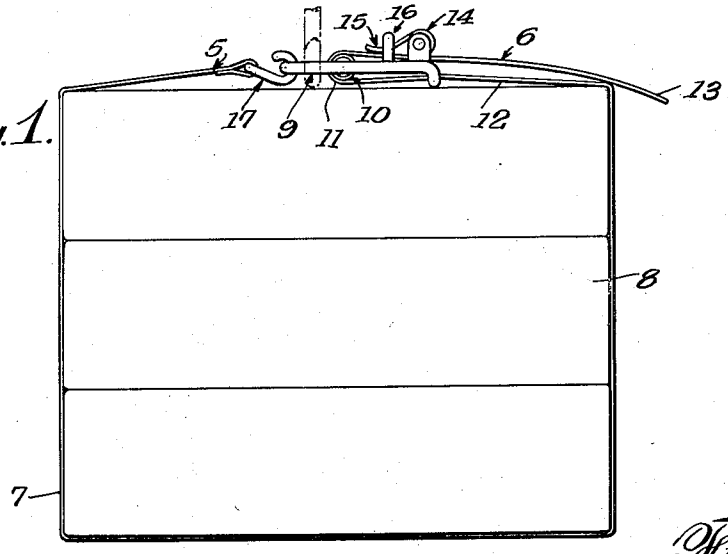


Fig. 2.

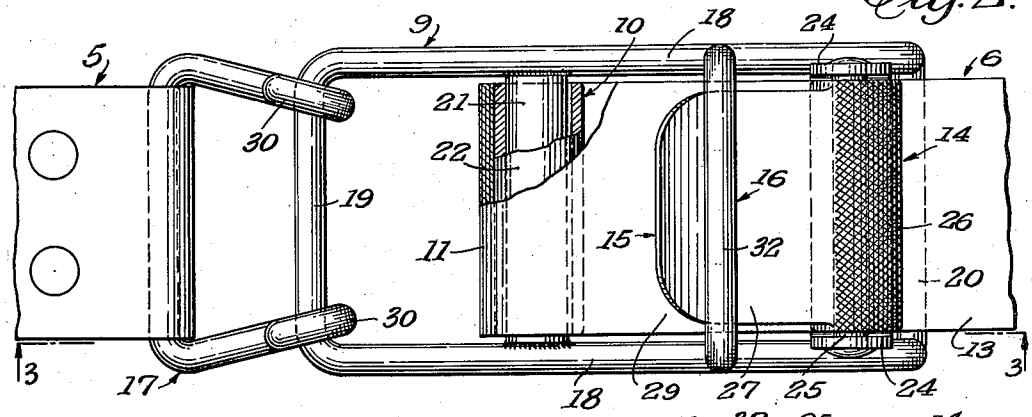
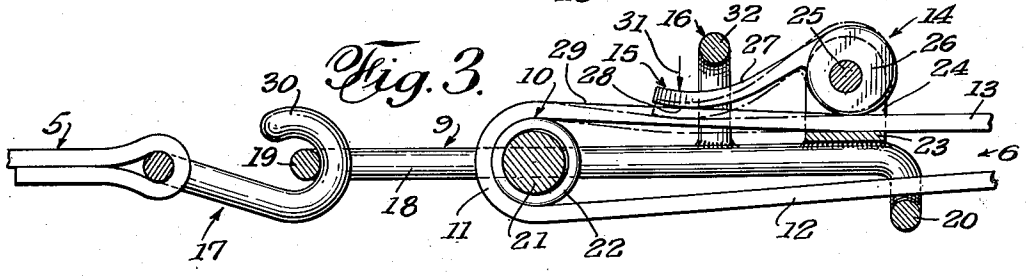


Fig. 3.



Inventor

EDWIN C. ELSNER

By C. G. Stratton

Attorney

Patented Jan. 16, 1951 2,538,641

UNITED STATES PATENT OFFICE

2,538,641

QUICK-RELEASE AUTOMATIC STRAP BUCKLE

Edwin C. Elsner, Burbank, Calif., assignor to C. J. W. Corporation, North Hollywood, Calif., a corporation of California

Application August 11, 1947, Serial No. 767,875

8 Claims. (Cl. 24—170)

1

This invention relates to a buckle for connecting the ends of a strap and while adapted for many uses, is particularly adapted as a buckle for connecting the ends of cargo straps or bands.

An object of the present invention is to provide a buckle whereby desired tautness of a strap can be attained, whereby said tautness will be retained, and whereby quick release of said tautness is effected for quick separation of the buckle parts.

Another object of the invention is to provide a buckle, as indicated, which embodies automatic strap gripping means effective to retain the strap under tension, whereby a simple pull on one end of the strap effects further tensioning thereof, and whereby quick release of the strap is effected and separation of the buckle parts made possible by a simple manual push on an element of the buckle.

Another object of the invention is to provide, in a strap buckle, novel strap gripping means that is automatically effective for gripping a strap, automatically releases upon a pull on a free end of said strap, and is adapted to be manually released by a simple push.

A further object of the invention is to provide a buckle, as above, in which the manually operable portion of the strap gripping means is protected against inadvertent operation.

My invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. However, the drawings merely show and the following description merely describes one embodiment of the present invention, and is given by way of illustration or example only.

In the drawings, like reference characters designate similar parts in the several views.

Fig. 1 is a side elevational view of the present buckle in operation connecting the ends of a strap.

Fig. 2 is an enlarged top plan view of the buckle.

Fig. 3 is a longitudinal sectional view as taken on line 3—3 of Fig. 2.

The illustrated buckle is shown as connecting the ends 5 and 6 of a strap 7 to tightly and firmly hold a cargo load 8 while the same is being moved.

The buckle comprises, generally, a frame 9,

2

roller means 10 mounted transversely of the frame at an intermediate part thereof for a loop 11 of said strap trained therearound so that the bight 12 of the strap between its ends is below a free end 13 of the strap end 6, means 14 for gripping the strap to maintain tension thereof, and extension 15 of the latter means and engaged with the strap to urge the gripping means into strap gripping position, means 16 carried by the frame and having overstanding relation to the extension to protect the same against inadvertent movement, and means 17 on the end 5 of the strap and having separable engagement with said frame.

The frame 9 is shown as formed of rod or heavy wire and is substantially rectangular having sides 18, an end 19, and a depressed end 20 opposite to the latter. The frame, of course, may be suitably formed in other ways.

The roller means 10 comprises a transverse pin or axle 21 welded to the sides 18 intermediate the length of the frame and preferably somewhat nearer to the end 19, and a freely rotatable tube 22 on said pin, said tube thereby comprising a roller over which the loop 11 of the strap is trained. It will be noted that the bight 12 of the strap extends over the frame end 20 and then under and around roller 22.

The gripping means 14 comprises a bracket which includes a plate or bar 23 arranged transversely across the frame sides 18 and adjacent to the end 20 thereof, a pair of integral ears 24 of said plate 23 extending upwardly on either side of the frame, a transverse pin 25 extending between the ears above said plate, and a preferably knurled eccentric roller 26 mounted on said pin to rock therearound. The plate 23 is welded to the frame in spaced relation to roller 22 and the free end 13 of the strap extends from the strap loop 11 and over said plate. The eccentric roller 26 is designed to effectively grip the strap end 13 between itself and said plate 23.

In normal use, as indicated in Fig. 1, the strap bight 12 is under tension to, thereby, exert a pull to the left (in Fig. 3) of the free strap end 13. This pull, when the knurled surface of eccentric 26 is frictionally in contact with the strap, causes rock of the latter to effect firmer gripping. Consequently, the stronger the tension on the strap bight 12, the firmer the grip of the means 14 on the strap end 13.

The extension 15 comprises a rigid lever 27 on gripping roller 26 and extending toward the roller 22. The end of said lever is preferably curved at 28 for smooth, non-sagging impinging engagement with the upper surface 29 of that portion of

the strap that extends between the rollers 22 and 26. The lever 27 is so angularly directed toward said surface 29 that the same seeks the mentioned engagement. When the strap end 13 is slack, as shown by the dot-dash lines of Fig. 3, the roller 26 has only slight or no contact with said strap end and by keeping said end slack by a manual pressure on lever 27, the effective length of the strap can be increased by either a pull on bight 12 or a pull in the opposite direction on the frame 9, the loop 11 merely traveling over the free roller 22, and by pulling on the free end 13, the effective length of the strap can be decreased. Consequently, by training the strap about a load 8, connecting hooks 30 of the means 17 with the end 19 of the frame, and simply pulling on the free end 13, the resultant tautness of the strap will effect a straightening of the mentioned portion thereof between rollers 22 and 26. Said strap portion will lift the lever 27 to cause roller 26 to rock in a strap-gripping direction. The force of the pull may approach the strength of the strap and yet, upon release of the free end 13, the means 14 will effectively grip the strap, it being evident that the eccentric grips stronger under greater tension.

When release of the buckle is desired, a simple manual push on lever 27 in the direction of arrow 31 will effect release rotation of eccentric 28 and, therefore, a slacking off of the strap. The power advantage obtained by the length of lever 27 over any tension on the strap is readily effective to effect this release and the same may be accomplished, in most instances, with the pressure of the thumb.

When the strap is sufficiently slacked off, the hooks 30 may be disengaged from the buckle frame, the strap laid open, and the cargo load removed. In order to minimize the friction between the lever 27 and the strap surface 29, said lever may be provided with a roller instead of the curved portion 28. Suitable lugs, struck from the lever, may serve to mount said roller.

In use, when moving a cargo load, the lever may inadvertently encounter a post, a hatch frame, etc. and be inadvertently depressed to effect spillage of the cargo load. To obviate this occurring, the means 16, comprising a rod or wire 32 welded to the frame, is provided in overstanding relation to said lever so as to protect the same. The means 16 also serves to limit the outer movement of the lever 27.

While I have illustrated and described what I now regard as the preferred embodiment of my invention, the construction is, of course, subject to modifications without departing from the spirit and scope of my invention. I, therefore, do not wish to restrict myself to the particular form of construction illustrated and described, but desire to avail myself of all modifications that may fall within the scope of the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A buckle for connecting the ends of a strap comprising a frame, a roller mounted transversely in the frame, one end of the strap being trained over said roller and doubled back in the direction of the bight of the strap to form a free end, wedging means carried by said frame in spaced relation to the roller and operable to grip said free end intermediate its length, an unsupported portion of said free end of the strap extending between the roller and the wedging means, an extension on said wedging means directed to impinge on said unsupported portion and held by the latter strap portion, when the same is taut, to hold the wedging means in gripping relation with the strap, and means on the other end of the strap having separable connection with the frame.

2. A buckle for connecting the ends of a strap comprising a frame, a roller mounted transversely in the frame, one end of the strap being trained over said roller and doubled back in the direction of the bight of the strap to form a free end, wedging means carried by said frame in spaced relation to the roller and operable to grip said free end intermediate its length, said wedging means comprising a transversely disposed eccentric member and a pressure bar associated therewith, an unsupported portion of said free end of the strap extending between the roller and the wedging means, an extension on the eccentric member of said wedging means directed to impinge on said unsupported portion and held by the latter strap portion, when the same is taut, to hold the eccentric member in position to grip the strap against the pressure bar, and means on the other end of the strap having separable connection with the frame.

3. A buckle for connecting the ends of a strap comprising a frame, a roller mounted transversely in the frame, one end of the strap being separably connected to the frame, the other end of the strap being trained around and over said roller to provide a doubled back strap-tautening free end, a pressure plate on said frame, an eccentric wedge associated with the plate to grip an intermediate portion of said free end and mounted to retain tautness of the strap and to release its grip under pull on said free end, an unsupported portion of said free end of the strap extending between the roller and the wedge, and an extension on said eccentric wedge directed to impinge on said unsupported portion and held by the latter strap portion, when the same is taut, to automatically hold the eccentric wedge in position to grip the strap against the pressure plate, said extension being manually depressible to move the eccentric wedge out of strap-gripping position to effect release of the strap end by the eccentric wedge.

4. A buckle for connecting the ends of a strap comprising a frame, a roller mounted transversely in the frame, one end of the strap being separably connected to the frame, the other end of the strap being trained around and over said roller to provide a doubled back strap-tautening free end, a pressure plate on said frame, an eccentric wedge associated with the plate to grip an intermediate portion of said free end and mounted to retain tautness of the strap and to release its grip under pull on said free end, an unsupported portion of said free end extending between the roller and the wedge, an extension on said eccentric wedge directed to impinge on said unsupported portion and held by the latter strap portion, when the same is taut, to automatically hold the eccentric wedge in position to grip the strap against the pressure plate, said extension being manually depressible to move the eccentric wedge out of strap-gripping position to effect release of the strap end by the eccentric wedge, and means having overstanding relation to the extension to protect the latter against inadvertent depression.

5. A strap buckle comprising a generally rectangular frame, a roller mounted transversely at an intermediate part of the frame for a loop formed by training the strap over the roller, a fixed pressure bar transverse of the frame, one

run of the strap loop extending over the bar and the other under the bar, an eccentric wedge mounted above the bar for gripping said upper run of the strap between itself and the bar, a rock pivot for the eccentric wedge, the upper run of the strap including an unsupported portion extending between the roller and the wedge, and an extension on the wedge having impinging engagement with said unsupported portion of the upper run of the strap to hold the eccentric wedge in position to grip the strap against said bar.

6. A strap buckle comprising a generally rectangular frame, a roller mounted transversely at an intermediate part of the frame for a loop formed by training the strap over the roller, a fixed pressure bar transverse of the frame, one run of the strap loop extending over the bar and the other under the bar, an eccentric wedge mounted above the bar for gripping said upper run of the strap between itself and the bar, a rock pivot for the eccentric wedge, the upper run of the strap including an unsupported portion extending between the roller and the wedge, and an extension on the wedge having impinging engagement with said unsupported portion of the upper run of the strap to hold the eccentric wedge in position to grip the strap against said bar, said extension being directed toward the roller and adapted to be manually depressed to rock the eccentric wedge in a strap-releasing direction.

7. A strap buckle comprising a generally rectangular frame, a roller mounted transversely at an intermediate part of the frame for a loop formed by training the strap over the roller, a fixed pressure bar transverse of the frame, one run of the strap loop extending over the bar and the other under the bar, an eccentric wedge mounted above the bar for gripping said upper run of the strap between itself and the bar, a rock pivot for the eccentric wedge, the upper run of the strap including an unsupported portion extending between the roller and the wedge, an extension on the wedge having impinging engagement with said unsupported portion of the upper run of the strap to hold the eccentric wedge in position to grip the strap against said bar, and a fixed transverse member having overstanding relation to said extension to protect the latter against inadvertent strap-releasing depression.

8. In a strap buckle, a roller over which a strap having a free end is trained, automatic wedging means spaced from the roller for gripping said free strap end upon tension being applied to the strap to draw said free end in a direction toward the roller, said free end of the strap having an unsupported flexible portion extending between the roller and the wedging means and which is tautened by the tension on the strap, and an extension on said wedging means having impinging engagement with the mentioned unsupported portion of the strap and held by the strap to releasably hold the wedging means in strap-gripping position, said flexible portion of the strap yielding to manual depression of the extension and the wedging means moving to non-gripping position when the extension is depressed.

EDWIN C. ELSNER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
238,247	Parsons	Mar. 1, 1881
1,505,125	Armstrong	Aug. 19, 1924
2,429,926	Davis	Oct. 28, 1947

FOREIGN PATENTS

Number	Country	Date
155,550	Germany	Nov. 1, 1904