A. L. WARD.

STRAP SECURING APPARATUS.

APPLICATION FILED JULY 13, 1918.

1,316,126.

Patented Sept. 16, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

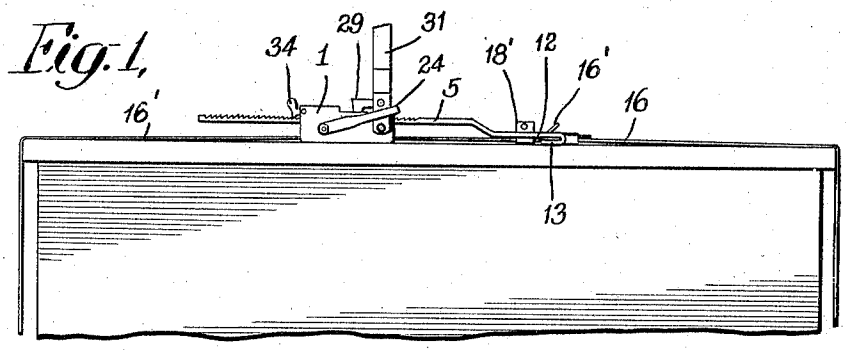


Fig. 2.

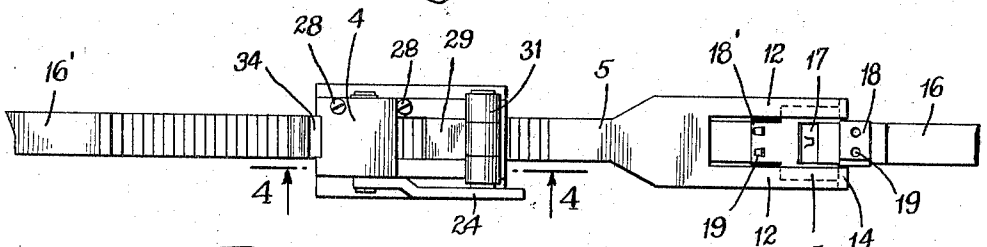
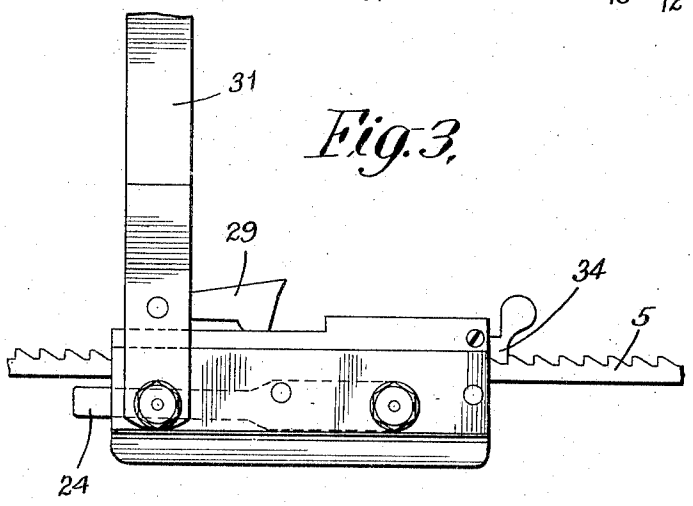


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

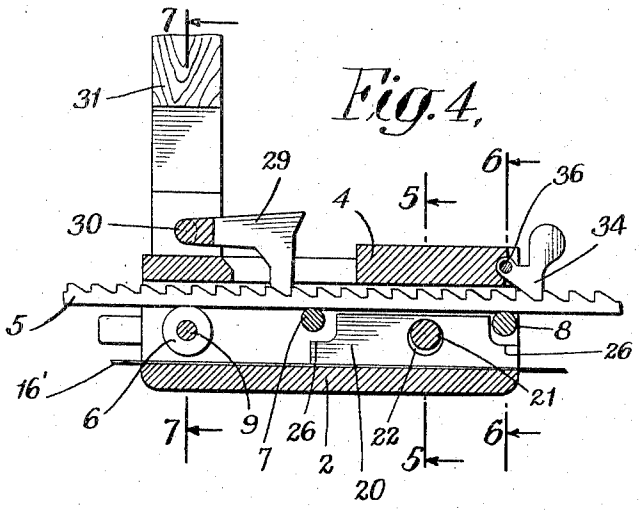


Fig. 5.

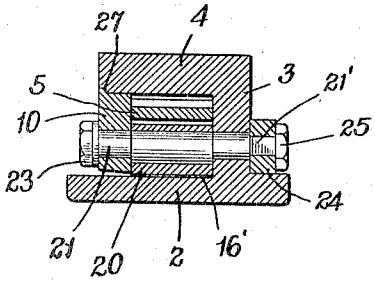


Fig. 6

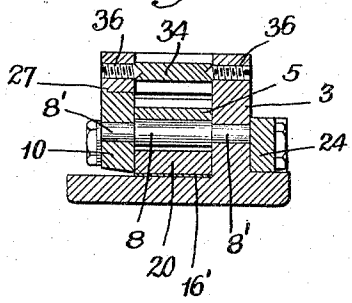
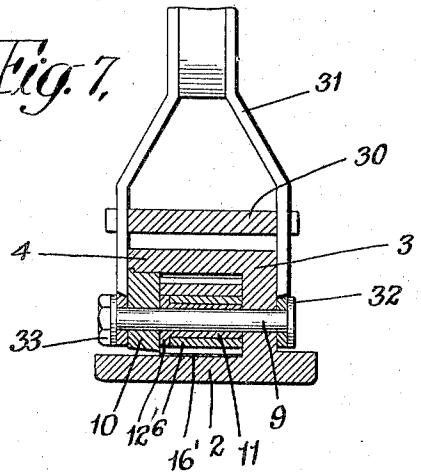


Fig. 7.



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STRAP-SECURING APPARATUS.

1,316,126. Specification of Letters Patent. Patented Sept. 16, 1919.

Application filed July 13, 1918. Serial No. 244,702.

To all whom it may concern:

Be it known that I, ALEXANDER L. WARD, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Strap-Securing Apparatus, of which the following is a specification.

My invention relates to apparatus for securing band straps under tension, about boxes, bales and other containers. My device is to be used in connection with a metal band or strap, one end of which is secured to a suitable buckle or securing device. The strap is passed around the box, or other article to be bound, and its opposite end passed through the buckle and the strap put under desired tension after which the last named end of the strap is secured to the buckle. My present invention relates to a device which may be set upon the top of a packing box or the like and which is adapted to be secured to one end of the strap, preferably by engaging the buckle or securing device to which that end of the strap has previously been fastened, the other end portion of the strap passing through the frame of the apparatus, to which it is clamped. This end portion of the strap passes from the point at which it is clamped to the tensioning apparatus, to the buckle referred to, through the opening in which it is extended. The device embodies a manually operated mechanism, such as a pawl, an operating lever therefor and a ratchet bar which engages the buckle so that operation of the pawl pulls up on the buckle and draws the same toward the device, the strap accordingly being tensioned all the way around the box to the point at which it is clamped to the tensioning device. From this point, which is quite close to the buckle, the end portion of the strap extends freely through the opening in the buckle, the buckle moving relatively thereto as it is drawn toward the device by the pawl and ratchet arrangement. When the strap has been sufficiently tensioned, the last named end of the strap is bent back over the buckle and over itself and is secured to the buckle, after which the device is unclamped from the strap and removed. My device is particularly designed for use in securing straps or bands by means of the form of buckle or securing device described and claimed in my application improvement in band securing devices, Serial No. 242,581, filed June 29, 1918, although it is obvious that other forms of buckles of the same general character may be used in connection with my present device. The objects of my invention are to produce simple and efficient devices of the character referred to.

In order that a clearer understanding of my invention may be had, attention is hereby directed to the accompanying drawings forming part of this application and illustrating certain improvements in my invention.

In the drawings Figure 1 represents a side elevation of my improved device mounted in operative position upon the top of a packing box, Fig. 2 is a top plan view of the device on an enlarged scale, Fig. 3 is an enlarged side elevation of the device viewed from the opposite side to that shown in Fig. 1, Fig. 4 is an enlarged vertical section taken upon line 4, 4 of Fig. 2 and Figs. 5, 6 and 7 are cross sections taken respectively on lines 5—5, 6—6, and 7—7 of Fig. 4.

Referring to the drawings the device embodies a frame 1 having a horizontal base portion 2 adapted to rest on the top of the packing box or other container to be strapped. The frame member 1 has a vertical side portion 3 rising from the base portion 2 and a horizontal top portion 4 extending above the base portion 2. A ratchet bar 5 extends horizontally through the space thus provided between the bottom portion 2, side portion 3 and top portion 4 of the frame. Rollers 6, 7 and 8 are provided on which the ratchet bar is mounted for movement. Roller 6 is mounted on a shaft 9 which extends through and has a bearing at one end in the side portion 3 of frame 1 and at the other end in a side member 10 which is fitted against the adjacent end of the top portion 4 of frame 1. Preferably roller 6 is mounted on a bushing 11 which extends around shaft 9 and has a shouldered portion 12′ at one end the outer surface of which engages side frame member 10 and the inner surface of which engages roller 6. Roller 8 has end portions 8^1 of reduced diameter rotatably mounted in the side portion 3 and side frame member 10, and roller 7 is similarly formed and mounted.

The ratchet bar 5 has a forwardly extending portion which is bent downwardly and provided with a forked end 12, 12, the ends of arms 12, 12 being bent downwardly and then rearwardly as shown at 13. The

hooks thus formed are adapted to be slipped over the edge or shoulder portion 14 of the buckle shown at 15, Fig. 2. End portion 16 of the band strap is secured to the buckle 15 as by passing the same through the slot 17 in the buckle and bending it back upon itself, after which the bent back portion may be secured to the body of the strap by means of the arms 18 of a strip which is bent around the strap and its bent back portion. The strap extends around the box and its opposite end portion 16^1 passes over the bottom portion 2 of the frame 1 of the device between the side portion 3 thereof and the side frame member 10, and thence extends to the buckle 15 and up through the slot 17. When the strap has been sufficiently tensioned by drawing up on the end 16 thereof the end of the portion 16^1 which extends up through slot 17 will be bent back upon itself and secured in that position. This may be accomplished by providing the bent back portion of the strap with holes suitably alined to register with the prongs 19 extending upwardly from the buckle, the arm portions 18^1 then being bent over the strap and pressed down to cause the prongs 19 to extend through the registering openings in the arms 18^1, this being the buckle construction described in my application referred to above.

The side frame member 10 does not extend down quite to the upper surface of the bottom frame portion 2 so that the strap portion 16^1 may be slipped into position through this opening, when the device is positioned for operation. The strap is first clamped against the bottom frame portion 2 by means of the block 20 which is mounted in position below ratchet bar 5 and between the side frame portions 3 and 10. A shaft 21 extends through block 20 and has bearings in side frame portions 3 and 10, the shaft being provided with a cam or eccentric portion 22 between side frames 3 and 10. The shaft 21 is threaded at one end and carries a nut 23 which bears against the outer surface of frame member 10. At its opposite end the shaft extends with a reduced portion 21^1 beyond the side frame 3 this portion 21^1 being squared and carrying a hand lever 24. A nut 25 is mounted on shaft 21 beyond the hand lever. The hand lever is adapted to swing through an arc of approximately 180 degrees to clamp or unclamp the strap 16^1, the lever being shown in the drawings in its clamping position. The clamping block 20 is provided at its ends with cut-out portions 26, 26 adapted to engage the under sides of rollers 7 and 8 when the strap is unclamped, to aline block 20 horizontally in raised position so that the strap may be passed under the same.

The side frame member 10 may be provided at its upper edge with a shoulder 27 to bear against the edge portion of the top of the frame member 4. A number of screws 28, shown in Fig. 2, may also be extended down through the top frame portions 4 into side frame 10 to secure the same in position, and side frame 10 is further held in position by bearing against the shoulder 12^1 of bushing 11 as shown in Fig. 6.

Ratchet bar 5 is operated by a pawl 29 pivoted on a stud 30 carried by the side frames of a bifurcated operating lever 31 the lower ends of which are rotatably mounted on the shaft 9 outside the side frame members 3 and 10. Shaft 9 is provided with an enlarged head 32 at one end between which and side member 3 the adjacent arm of the bifurcated lever 31 is mounted, shaft 9 being provided at the opposite end with a nut 33 and a washer between which and the adjacent side frame 10 the adjacent arm of the bifurcated lever is mounted.

A gravity pawl 34 is pivoted on pin 36 at the end of the device opposite from that at which the operating lever 31 is shown, this pawl coacting with the teeth of the ratchet bar to prevent return motion of the latter. Pawl 34 is preferably mounted between a pair of screws 36, 36 which extend through the upper side portions of the frame, the faces of pawl 34 being cupped out to receive the ends of the screws 36, a suitable recess being formed in the upper portion of the frame in which pawl 34 is pivotally mounted.

The operation of the device will now be clear. The end 16 of the strap being secured to buckle 15, as described, the frame 1 is mounted on top of the box, or other article to be strapped, and the hook end 13 of the ratchet bar slipped around the shoulder or edge portion 14 of the buckle, after which the strap is extended around the box and its opposite end portion, 16^1, threaded through the frame of the device above the bottom portion 2 thereof and between the side portions 3 and 10, the cam lever 24 being in a position about 180 degrees distant from that illustrated in the drawings so that the block 20 is raised. The end portion 16^1 of the strap is then extended upwardly through the slot 17 in buckle 15 as is indicated in Fig. 1. The strap is then firmly clamped to the apparatus by cam lever 24 in the position shown, in which block 20 firmly clamps the strap against the bottom portion 2 of the device. Hand lever 31 is then operated to force the ratchet bar toward the device and to accordingly tension the strap from the buckle 15 all the way around the box to the point at which the strap is clamped to the device. During this movement of the ratchet bar, the end portion 16^1 of the strap will move freely through the slot 17 of the buckle as the buckle moves over the same toward the frame 1. When

the strap has been sufficiently tensioned the end portion 16^1 of the strap, which extends through the slot of the buckle, is bent back upon itself, holes are formed therein through which the prongs 19 of the buckle extend and the arms 18^1 are pressed down over the strap to secure this end portion of the strap firmly to the buckle as previously described, the device for punching the holes in the bent back portion of the strap, and pressing the arms 18^1 down upon the same, not being illustrated herein. The cam lever 24 is then thrown into releasing position and the device is moved laterally to free the same from the strap, the strap moving out through the space indicated in the drawings below the side frame member 10.

It will be obvious that my invention is not strictly limited to the exact details of the construction described but that all reasonable equivalents are included herein.

What I claim is:

1. Apparatus for securing band straps under tension about boxes, comprising a frame having a bottom portion with a flat base, adapted to set on a box, and vertical side portions above said bottom portion, a ratchet-bar slidably mounted therein, between said side portions and above said bottom portion, and having a hooked end adapted to engage the edge of a buckle to which one end of a strap is secured, said frame having an opening therethrough, below said bar and above said bottom portion, for the passage of the other end portion of the strap extending to the buckle, said bottom portion having a horizontal upper surface between said side portions, means for clamping the strap against the upper surface of said bottom portion, in said opening, and a pawl and operating device therefor for operating said ratchet-bar to draw up on the buckle and strap.

2. Apparatus for securing band straps under tension about boxes, comprising a frame having a bottom portion, with an upper surface, and a bottom surface adapted to set on a box, and two side portions, one of which extends not quite down to the upper surface of the bottom portion, a ratchet-bar, slidably mounted between said side portions, and above said bottom portion, and having an end portion extending beyond the same, adapted to be secured to a strap end, space being provided above the bottom portion of the frame, and below said bar, parallel to said bar, for the passage of the opposite strap end, a hand lever, pivoted to said frame, and a pawl for operating said ratchet-bar, pivoted to said lever, a clamping block below said bar, having a flat lower surface, parallel to the upper surface of said bottom portion, for clamping the opposite end portion of the strap upon the bottom portion of the frame, eccentric means supporting said block, and hand operated means to operate said eccentric means to clamp and unclamp the strap.

3. Apparatus for securing band straps under tension about boxes, comprising a frame, having a bottom portion adapted to set on a box, a bar mounted for horizontal movement through said frame above said bottom portion and having an end extending beyond said frame, and arranged to hook over a buckle to which one end of a strap is secured, a clamping block below and in alinement with said bar and above said bottom portion, means for supporting the same in raised position so as to leave a space between said block and bottom portion and for forcing the same down to press the opposite end portion of the strap against said bottom portion, means for alining said block horizontally when in raised position, and means for operating said bar to draw said buckle and attached strap end toward said frame.

4. Apparatus for securing band straps under tension about boxes, comprising a frame having a bottom portion adapted to set on a box, with side portions and a lengthwise opening between the same, antifriction bearing means, a ratchet bar mounted thereon for horizontal movement in said opening and having an end extending beyond said frame and arranged to engage a buckle to which one end of a strap is secured, a hand lever, pivoted to said frame, and a pawl for operating said ratchet bar, pivoted to said lever, a clamping block arranged horizontally in said opening, directly below said bar and above said bottom frame portion, for clamping the opposite end portion of the strap to the bottom portion of the frame, eccentric means supporting said block, and a hand lever to operate said eccentric means to clamp and unclamp the strap.

This specification signed and witnessed this 1st day of July, 1918.

ALEXANDER L. WARD.

Witnesses:
DYER SMITH,
M. S. GANG.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."