

April 21, 1953

P. LEVINE

2,635,313

BUCKLE

Filed Sept. 15, 1947

3 Sheets-Sheet 1

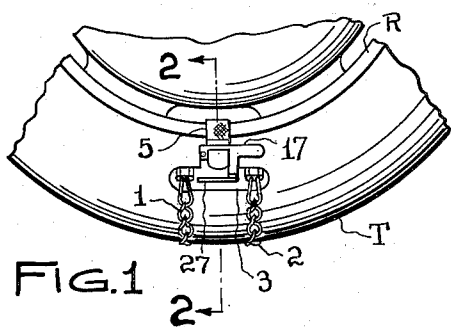


FIG. 1

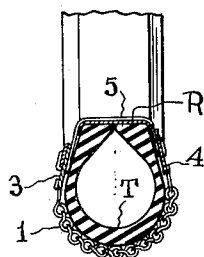


FIG. 2

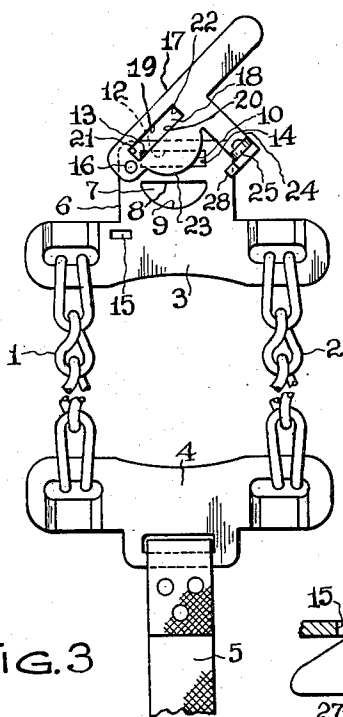


FIG. 3

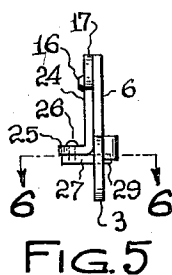


FIG. 5

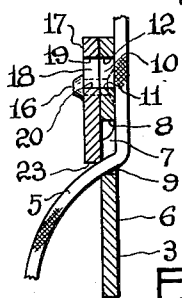


FIG. 7

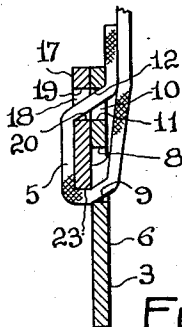


FIG. 8

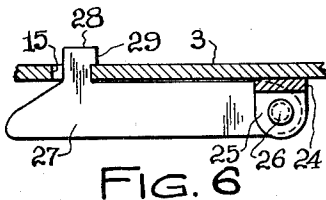


FIG. 6

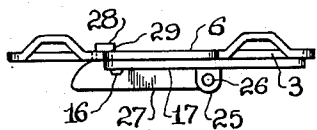


FIG. 4

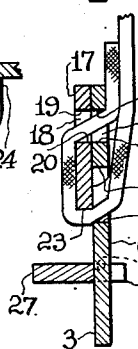


FIG. 9

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3 Sheets-Sheet 2

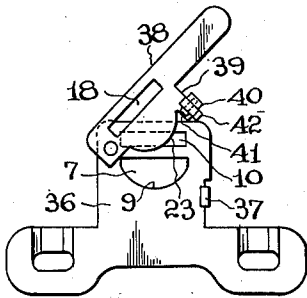


FIG. 10

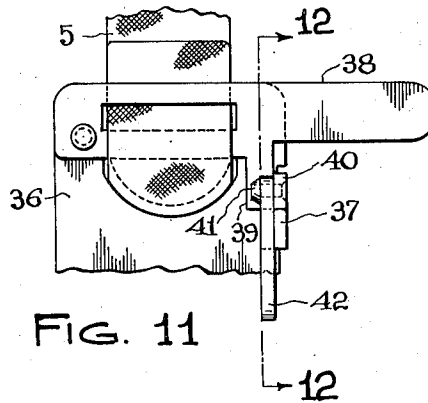


FIG. 11

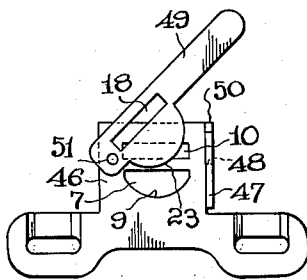


FIG. 14

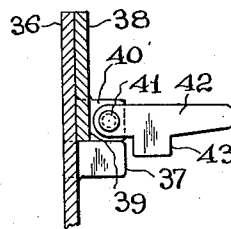


FIG. 13

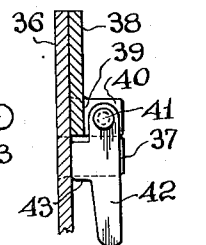


FIG. 12

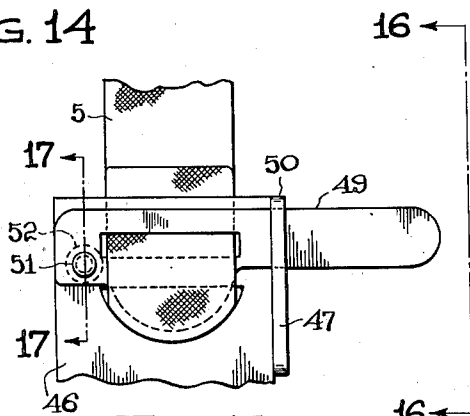


FIG. 15

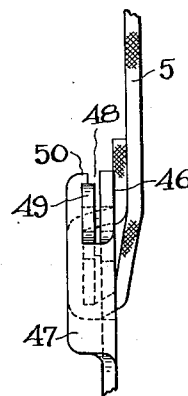


FIG. 16

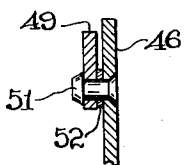


FIG. 17

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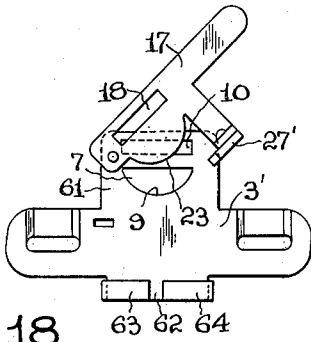


FIG. 18

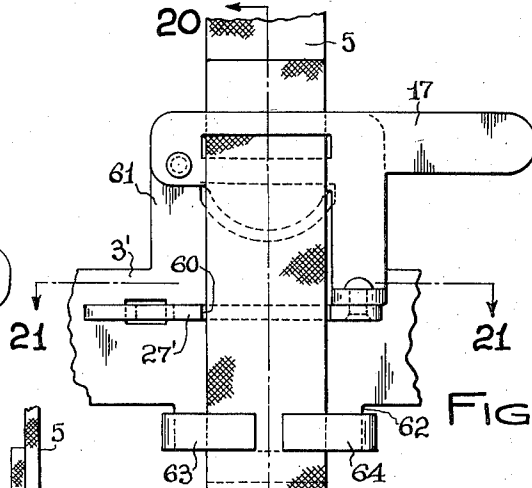


FIG. 19

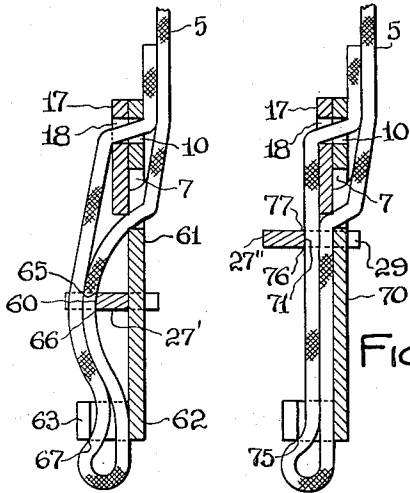


FIG. 20

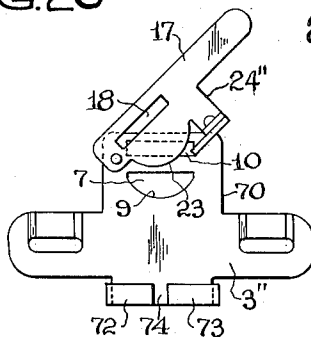


FIG. 22

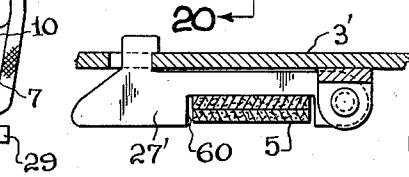


FIG. 21

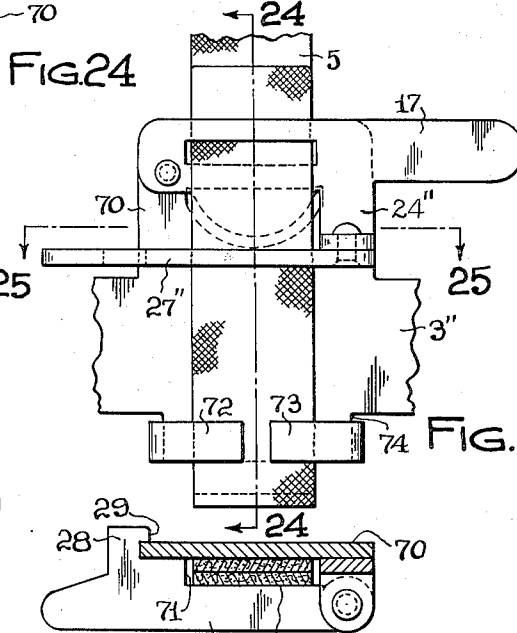


FIG. 23

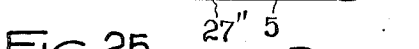


FIG. 24



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## UNITED STATES PATENT OFFICE

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BUCKLE

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Application September 15, 1947, Serial No. 774,077

12 Claims. (Cl. 24—170)

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This invention relates, as indicated, to buckles, but has reference more particularly to that type of buckle which is generally used in connection with tire chains or other traction-gaining devices commonly known as emergency chains, and which are adapted to be secured to the wheel of a vehicle without moving the vehicle or raising the wheel. While the buckle may be used for other purposes, it will be described in connection with such a traction-gaining device.

A primary object of the invention is to provide a buckle of the character described, which can be easily and quickly secured to the strap which is commonly associated with such emergency chains, and which, when thus secured to the strap, is effective to resist virtually any and all efforts, short of actual breaking of the strap, to disengage the strap from the buckle or vice versa.

Another object of the invention is to provide a buckle of the character described, which is of extremely rugged and durable construction, consisting of a minimum number of easily manufactured and readily assembled parts.

A further object of the invention is to provide a buckle of the character described, having incorporated therein a novel strap-gripping lever which can be manipulated with ease in the course of securing the strap to the buckle.

A still further object of the invention is to provide a buckle of the character described, having incorporated therein a second lever which is effective to lock the first lever in strap-gripping position.

Other objects and advantages of the invention will become apparent in the course of the following description and from the accompanying drawings, wherein

Fig. 1 is a fragmentary side elevational view of an emergency chain unit secured in position on the wheel of a motor vehicle by a preferred form of buckle embodying the invention;

Fig. 2 is a cross-sectional view, taken on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary elevational view of the device, showing the buckle in open condition, preparatory to the attachment of the strap thereto;

Fig. 4 is a top plan view of the buckle shown in Fig. 3, but with the levers in closed position;

Fig. 5 is a side elevational view of the buckle, as viewed from the right side of Fig. 3, but with the levers in closed position;

Fig. 6 is a fragmentary cross-sectional view, taken on the line 6—6 of Fig. 5;

Fig. 7 is a fragmentary cross-sectional view, taken on approximately the line 2—2 of Fig. 1, but showing the first step in the attachment of the strap to the buckle;

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Fig. 8 is a view similar to Fig. 7, but showing the second step in the attachment of the strap to the buckle;

Fig. 9 is a view similar to Fig. 8, but showing the final step in the attachment of the strap to the buckle;

Fig. 10 is a view similar to Fig. 3, but showing a modification of the buckle;

Fig. 11 is a view, on an enlarged scale, showing the buckle of Fig. 10 in locked or strap-gripping position;

Fig. 12 is a fragmentary cross-sectional view, taken on the line 12—12 of Fig. 11;

Fig. 13 is a view similar to Fig. 12, but showing the locking in open position;

Fig. 14 is a view similar to Fig. 10, but showing another modification of the buckle;

Fig. 15 is a view similar to Fig. 11, but of the buckle shown in Fig. 14;

Fig. 16 is an end elevational view, looking in the direction indicated by the arrows 16—16 in Fig. 15;

Fig. 17 is a fragmentary cross-sectional view, taken on the line 17—17 of Fig. 15;

Fig. 18 is a view similar to Fig. 14, but showing a third modification of the invention;

Fig. 19 is a view similar to Fig. 15, but of the buckle shown in Fig. 18;

Fig. 20 is a fragmentary cross-sectional view, taken on the line 20—20 of Fig. 19;

Fig. 21 is a fragmentary cross-sectional view, taken on the line 21—21 of Fig. 19;

Fig. 22 is a view similar to Fig. 18, but showing a fourth modification of the invention;

Fig. 23 is a view similar to Fig. 19, but of the buckle shown in Fig. 22;

Fig. 24 is a fragmentary cross-sectional view, taken on the line 24—24 of Fig. 23, and

Fig. 25 is a fragmentary cross-sectional view, taken on the line 25—25 of Fig. 23.

Referring more especially to Figs. 1 to 9 inclusive of the drawings, the numerals 1 and 2 designate a pair of chains or similar traction-gaining members, which are designed to fit about the tread portion of the tire T of a vehicle wheel. The ends of the chains 1 and 2 are connected to cross-bars 3 and 4 which support the chains and space them apart circumferentially of the tire. The cross-bar 3, in this case, is an integral part of the novel buckle of the present invention.

Connected to the central portion of the cross-bar 4 is an elongated flexible member 5, such as a woven fabric strap, this strap being of sufficient length to pass over and around the inner part of the tire T and rim R, and into secured relationship with the buckle to be now described.

The cross-bar 3 is, as stated, an integral part

of the buckle, and has extending from one edge thereof intermediate its ends and in a direction opposite the chains, a plate 6 which is of generally rectangular shape. The plate 6 has an entrant opening 7 therein, one wall or edge 8 of which is straight and substantially parallel with the cross-bar 4, and the other wall or edge 9 of which is of curved or arcuate form. The plate has a second slot or reentrant opening 10 of substantially the same length as the opening 7, which is bounded by walls 11 and 12 which are parallel with the wall 8 of the opening 7, and by end walls 13 and 14 at right angles to the walls 11 and 12. The cross-bar 4 is also provided with a slot or opening 15 which is disposed adjacent one end of the plate 6 and which serves a purpose to be presently described.

Pivotally secured to plate 6, as by means of a rivet 16 disposed adjacent the end wall 13 of the slot 10 is a lever 17, which is pivotally movable in a plane parallel to the plane of the plate 6. This lever is provided with a slot or opening 18 similar in size to the slot or opening 10 and bounded by walls 19, 20, 21 and 22. In the strap-gripping position of this lever, the slot or opening 18 is registered or aligned with the opening 10 in the plate 6.

The lever 17 is provided with an arcuate or curved lower edge 23, which, in the strap-gripping position of the lever, is substantially parallel with the wall 9 of the opening 7, but is spaced slightly from the latter wall.

The lever 17 is further provided intermediate its ends with an arm 24 extending downwardly therefrom and terminating in a forwardly extending lug 25. Pivotally secured to the lug 25, as by a rivet 26, is a second or locking lever 27, which has a pivotal movement in a plane normal to the plane of movement of the lever 17. The lever 27 is provided adjacent its free end with a rearwardly extending hook-shaped lug 28 adapted to enter the slot or opening 15 in the cross-bar 3.

The operation or use of the aforesaid buckle is as follows:

The device, as described, is properly fitted about the tire and rim of the vehicle, and the free end of the strap 5 is passed through the entrant opening 7 in the plate 6, being inserted in this opening through the rear of the opening. After the strap has been pulled or drawn until it is taut, the lever 17 is swung downwardly, until the openings 18 and 10 are in registration, causing the edge 23 of the lever to firmly grip or clamp the strap between such edge and the edge 9 of the opening 7. Due to the curvature of these edges, the strap is gripped with a wedge-like force or action which is effective to firmly resist any tendency to separate the strap from the buckle.

After the strap has been thus gripped, the lever 27 is pushed toward the cross-bar 3, and the hook-shaped lug 28 caused to enter the opening 15 in the cross-bar 3. The tension of the strap on the lever 17 is such as to cause this lever to move in a counter-clockwise direction about the pivot 16, as viewed in Fig. 3, to an extent sufficient to cause the flange 29 of the hook 28 to engage behind the cross-bar, thereby locking the levers 27 and 17 in closed position.

The end of the strap is then passed upwardly and rearwardly through the aligned slots 18 and 10 and then upwardly into parallelism with the body of the strap. This is highly advantageous

for several reasons. In the first place, it removes the free end of the strap to a position in which it is not likely to become snagged or caught on other objects, and is less likely to be tampered with by unauthorized persons than if it protruded outwardly from the buckle. In the second place, the pressure of the tire against the strap causes the free end of the strap to be gripped at at least two points in addition to the point of primary gripping which has been described. This is evident in Figs. 8 and 9, in which the free end of the strap is gripped against the outer edge of the wall 20 of the opening 18 and against the inner edge of the wall 12 of the opening 10.

The strap is thus gripped at three distinct points, the points of secondary gripping being effective to prevent accidental removal of the free end of the strap from the buckle. The strap cannot be released from the buckle, until the lever 27 has been unlocked and the lever 17 swung upwardly to its open position.

It is thus seen that I have provided a buckle which can be quickly and easily secured to the strap which is associated with the emergency chains; which, when secured to the strap, is effective to resist virtually any and all efforts, short of actual breaking of the strap, to disengage the strap from the buckle or vice versa; which is of extremely rugged and durable construction, and consists of a minimum number of easily manufactured and readily assembled parts; which has incorporated therein, a novel strap-gripping lever which can be manipulated with ease in the course of securing the strap to the buckle, and which also has incorporated therein a second lever which is effective to lock the first lever in strap-gripping position.

In Figs. 10 to 13 inclusive, the buckle is similar in construction to that shown in Figs. 1 to 9 inclusive, but in this case, the plate 36 of the buckle is provided with a forwardly extending flange or lug 37 adjacent one end of the plate. The lever 38 has a downwardly extending arm 39 provided with a forwardly extending flange or lug 40 which, in the strap-gripping position of the lever 38 (see Fig. 11), is disposed directly above the lug 37, the latter, in effect, serving as a stop to limit the downward movement of the lever.

Pivotally secured to the lug 40, as by means of a rivet 41, is a second or locking lever 42, provided with an arm 43.

With the buckle in the open position shown in Fig. 10, the strap 5 is passed through the entrant opening 7 in the plate 36, being inserted in this opening through the rear of the opening. After the strap has been pulled or drawn until it is taut, the lever 38 is swung downwardly until the openings 18 and 10 are in registration, causing the edge 23 of the lever to firmly grip or clamp the strap between such edge and the edge 9 of the opening 7. After the strap has been thus gripped, the lever 42 is moved downwardly from the position shown in Fig. 13 to that shown in Fig. 12, the plate 36 serving as a stop for the arm 43 of the lever 42 to limit the movement of the lever, as clearly shown in Fig. 12. The frictional engagement of the lever 42 with the lug 37, due to the tension of the strap 5 on the lever 38, is such as to maintain the lever 38 in strap-gripping position, from which it can be released only upon exerting a considerable pull on the lever 42. The lever 42, in other words,

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serves a function similar to that of the lever 27 in the previously-described form of buckle.

The end of the strap 5 is then passed upwardly and rearwardly through the aligned slots 18 and 10, as shown in Fig. 11, and then upwardly into parallelism with the body of the strap. The function of the slots 18 and 10, in this case, is identical with that of the similarly-numbered slots in the previously-described form of buckle, so that further description thereof is unnecessary.

In Figs. 14 to 17 inclusive, the plate 46 is provided at one edge with a forwardly-extending flange 47, a portion of which is removed to provide a recess 48 for the reception of a lever 49. The portion of the flange 47 adjacent the recess 48 is provided at its upper end with a rearwardly-extending flange or hook 50, which overhangs a portion of the recess 48. In other words, one wall of the recess 48 is undercut to leave the flange or hook 50.

The lever 49 is pivotally secured to the plate 46 by means of a rivet 51, a washer or spacer 52 being interposed between the lever and plate 46, as shown in Figs. 15 and 17, for a purpose to be presently described.

With the buckle in the open position shown in Fig. 14, the strap 5 is passed through the entrant opening 7 in the plate 46, being inserted in this opening through the rear of the opening. After the strap has been pulled or drawn until it is taut, the lever 49 is swung downwardly until the openings 18 and 10 are in registration, causing the edge 23 of the lever to firmly grip or clamp the strap between such edge and the edge 9 of the opening 7.

While the lever 49 is thus moved downwardly, it is biased toward the plate 46 so as to permit it to enter the recess 48. This biasing or bending of the lever 49 towards the plate 46 is permitted by virtue of the provision of the washer 52 which thus spaces the lever 49 about a sixteenth of an inch from the front face of the plate 46. After the lever 49 has passed below the level of the lower edge of the hook 50, it is released, its inherent resiliency causing it to resume its natural position of parallelism with the plate 46, in which position it is locked by the hook 50, as clearly shown in Fig. 16.

The engagement of the lever 49 with the hook 50 is maintained by the tension of the strap 5 on the lever 49, and this engagement is maintained until the lever 49 is released by biasing the lever toward the plate 46.

The end of the strap 5 is then passed upwardly and rearwardly through the aligned slots 18 and 10, as shown in Fig. 15, and then upwardly into parallelism with the body of the strap. The function of the slots 18 and 10, in this case, is identical with those of the previously-described forms of the invention, so that further description thereof is unnecessary. This modification of the invention, however, has the advantage that it does not require the second locking lever which is part of the previously-described forms of buckle.

In Figs. 18 to 21 inclusive, the construction is similar in many respects to that shown in Figs. 1 to 9 inclusive. In this case, however, the lever 27' has a recess 60 in its outer edge which recess, as clearly shown in Fig. 21, is slightly wider than the width of the strap 5, and has a depth of approximately twice the thickness of the strap. The cross-bar 3' has extending from its lower edge, in a direction opposite to that of the plate 61, an extension or tenon 62 of generally rec-

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tangular shape, and provided at its ends with flanges, which are rebent, to provide keepers 63 and 64 which overlie the tenon 62, in spaced relation to the latter, as clearly shown in Figs. 19 and 20. The ends of the keepers 63 and 64 are spaced from each other, as shown in Figs. 18 and 19, and the spacing of the keepers from the tenon 62 is more than twice the thickness of the strap 5, as clearly shown in Fig. 20.

In attaching the strap to the buckle, the strap 5 is passed through the opening 7 in the plate 61, being inserted in this opening through the rear of the opening. After the strap has been pulled or drawn until it is taut, the lever 17 is swung downwardly until the openings 18 and 10 are in registration, causing the edge 23 of the lever to firmly grip or clamp the strap between such edge and the edge 9 of the opening 7. After the strap has been thus gripped, the lever 27' is pushed toward the cross-bar 3', the lever being then locked to the cross-bar in the same manner that the lever 27 of the buckle shown in Fig. 6 is locked to the cross-bar 3.

The end of the strap is then passed through the recess 60 in the lever 27', then through the space between the keepers 63 and 64 and the tenon 62, then bent upwardly to pass through the space between the strap and keepers 63 and 64, as shown in Fig. 20, then through the recess 60, then through the aligned slots 18 and 10, and finally into parallelism with the body of the strap.

In this manner, the strap is gripped or snubbed at several points additional to those described in connection with Figs. 1 to 9 inclusive. These points are indicated at 65, 66 and 67 in Fig. 20, these points of engagement of the strap with the buckle serving to augment the connection of the strap with the buckle.

In Figs. 22 to 25 inclusive, the construction is similar to that shown in Figs. 18 to 21 inclusive. In this case, however, the arm 24'' of the lever 17 is somewhat shorter than the corresponding arm of the lever 17 in Fig. 18, so that the flange 29 of the hook 28 of the lever 27'' will engage behind one edge of the plate 70 of the buckle, as shown in Fig. 25, thus dispensing with the need for the opening 15 of that form of the buckle shown in Figs. 1 to 9. In this case, moreover, the lever 27'' has a recess 71 in its inner edge, instead of its outer edge, which recess, as clearly shown in Fig. 25, is slightly wider than the width of the strap 5, and has a depth of approximately twice the thickness of the strap. The buckle is further provided with keepers 72 and 73, similar to the keepers 63 and 64 of the buckle shown in Fig. 18.

In attaching the strap to the buckle, the strap 5 is passed through the opening 7 in the plate 70, being inserted in this opening through the rear of the opening. After the strap has been pulled or drawn until it is taut, the lever 17 is swung downwardly until the openings 18 and 10 are in registration, causing the edge 23 of the lever to firmly grip or clamp the strap between such edge and the edge 9 of the opening 7. After the strap has been thus gripped, the lever 27'' is pushed toward the cross-bar 3'', but is not locked to the plate 70.

The end of the strap 5 is then passed through the recess 71 in the lever 27'', then through the space between the keepers 72 and 73 and the tenon 74, then bent upwardly to pass through the space between the strap and the keepers 72 and 73, as shown in Fig. 24, then through the

recess 71, after which the lever 27" is locked to the cross-bar 3" in the same manner that the lever 27 of the buckle shown in Fig. 6 is locked to the cross-bar 3. The strap is then passed through the aligned slots 18 and 10, and finally into parallelism with the body of the strap.

In this manner, the strap is gripped or snubbed at several points additional to those described in connection with Figs. 1 and 9 inclusive. These points are indicated at 75, 76 and 77 in Fig. 24, these points of engagement of the strap with the buckle serving to augment the connection of the strap with the buckle.

It is to be understood that the forms of my invention, herewith shown and described, are to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of my invention, or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A strap-securing buckle comprising an apertured plate, a strap-clamping member pivotally mounted on said plate and adapted to releasably clamp a strap under tension in a clamping zone between said member and the apertured portion of said plate, and strap-engaging edges provided on the apertured portion of said plate and on said member at a point spaced from said clamping zone, said edges being effective to simultaneously frictionally grip the free end of a strap passed therebetween in response to pivotal movement of said member from its clamping position caused by said tension.

2. A strap-securing buckle comprising an apertured plate, a strap-clamping member mounted on said plate for pivotal movement in a plane parallel therewith and adapted to releasably clamp the strap at a clamping point between said plate and said member, and means integral with said plate and said member and adapted to receive the free end of the said strap when said member is in clamping position, said means being effective to grip said strap at a second point spaced from said clamping point in response to strap induced releasing movement of said member from said clamping position.

3. In a buckle of the character described, a plate apertured to provide two oppositely disposed strap-positioning edges, and a pivotally movable clamping member secured to said plate for movement in a plane parallel thereto, said clamping member having two oppositely disposed strap-engaging edges, said clamping member being rotatable to a position wherein said strap-engaging edges lie intermediate said strap-positioning edges whereby to clamp a strap passed between one set of adjacent positioning and engaging edges, the other set of positioning and engaging edges defining a strap-receiving aperture of a width corresponding substantially to the thickness of said strap only when said member has been rotated to strap clamping position whereby strap-induced counter-rotation of said clamping member is prevented when the free end of said strap is passed through said strap-receiving aperture.

4. A combination, as defined in claim 3, in which locking means are provided on said plate for engagement with said clamping member to releasably secure said member in strap-clamping position.

5. A strap-securing buckle comprising a plate, a strap-clamping member pivotally secured to said plate for rotation in a plane substantially

parallel thereto, whereby to clamp a strap traversing said plate, means provided on said plate and said member for simultaneously gripping said strap at a point spaced from said clamping point in response to a strap-induced counter-rotation of said member, and locking means for releasably securing said member in clamping position.

6. A strap-securing buckle comprising a plate, a strap-clamping member pivotally secured to said plate for rotation in a plane substantially parallel thereto, whereby to clamp a strap traversing said plate, means provided on said plate and said member for simultaneously gripping said strap at a point spaced from said clamping point in response to strap-induced counter-rotation of said member, locking means on said plate for releasably securing said member in clamping position, said locking means comprising a laterally projecting arm provided on said strap clamping member and arm-engaging means formed on said plate in the path of movement of said arm.

7. A buckle as defined in claim 5 in which said means comprises a lever pivotally secured to said member and having a hooked engagement with said plate.

8. A buckle as defined in claim 5 in which said means comprises a lever pivotally secured to said member and having frictional engagement with said plate.

9. A buckle as claimed in claim 5 in which said plate has a flange at one edge thereof said flange having a recess therein, and said locking means comprising a lever, said flange having a hook thereon engaging said lever.

10. A buckle as defined in claim 7, in which said lever has a recess in its outer edge for the reception of a portion of said strap.

11. A buckle as defined in claim 7 in which said lever has a recess in its inner edge for reception of a portion of said strap.

12. In a buckle of the character described, a plate having an opening therein, one edge of said opening being arcuate in form, a slot in said plate in spaced relation to said opening, a lever pivotally connected to said plate and having an arcuate edge adapted to coact with the arcuate edge of said opening to clamp a strap therebetween, said lever having a slot adapted for registration with the slot in said plate when the lever is in strap-clamping position, whereby said registered slots are adapted to receive the free end of said strap therethrough.

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#### References Cited in the file of this patent

##### UNITED STATES PATENTS

| Number    | Name       | Date          |
|-----------|------------|---------------|
| 81,312    | Weaver     | Aug. 18, 1868 |
| 84,450    | Weaver     | Nov. 24, 1868 |
| 222,055   | Johnson    | Nov. 25, 1879 |
| 616,359   | Rosenkranz | Dec. 20, 1898 |
| 941,136   | Dubois     | Nov. 23, 1909 |
| 1,020,760 | Hubbard    | Mar. 19, 1912 |
| 1,347,827 | Raymer     | July 27, 1920 |
| 1,751,925 | Kelley     | Mar. 20, 1930 |
| 1,914,299 | Sauerwald  | June 13, 1933 |
| 2,057,012 | Craig      | Oct. 13, 1936 |

##### FOREIGN PATENTS

| Number  | Country       | Date          |
|---------|---------------|---------------|
| 23,821  | Great Britain | of 1896       |
| 294,719 | Germany       | Oct. 23, 1916 |
| 554,802 | France        | Mar. 9, 1923  |