BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings wherein the same reference characters designate the same or similar parts in all of the views:

FIG. 1 is a vertical section view of a padlock equipped with a tapered shackle leg;
FIG. 2 is a fragmentary horizontal sectional view taken approximately along the line 2—2 in FIG. 1;
FIG. 3 is a fragmentary vertical sectional view through a portion of a laminated padlock case showing the tapered shackle leg or heel in its raised or outwardly projected position;
FIG. 4 is a fragmentary horizontal sectional view taken approximately along line 4—4 of FIG. 3; and
FIG. 5 is a side view of a padlock shackle with a tapered leg.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Although not limited thereto, the improved tapered shackle leg finds particular utility in connection with a laminated padlock which, by way of example, is illustrated in the accompanying drawings wherein the body or case of a padlock is indicated generally by the numeral 10. The laminated character of the case results from the fact that it is built up of a plurality of superimposed plates or laminations 11 secured together by rivets 12. Various openings in the plates 11 form cavities or recesses for certain of the lock mechanism. An intermediate plate 11' is specially formed to serve as a shackle leg bearing plate and toward one end thereof it is formed with a circular flanged opening 13 aligned with the openings in the superimposed companion laminations which form a vertical case opening 14 for the long leg or heel 15 of the padlock shackle 16 but of reduced diameter relative thereto. The shackle also includes a short leg or toe 17 having a locking lever-receiving notch 18 therein. The short leg 17 of the shackle is longitudinally movably received by another vertical case opening 19. Obviously, the shackle is movable inwardly and outwardly relative to the case 10, it being illustrated in its inner or locked position in FIG. 1, and in FIG. 3 the long leg 15 of the shackle is shown in an outwardly projected or raised position wherein the shackle toe 17 (not shown) is released and raised free of the upper end of the padlock case. The shackle leg 15 is yieldingly urged toward its projected position by a confined coiled spring 20 which reacts against the leg end enlargement 21.

As is conventional, there is housed within a suitable cavity within the padlock case a key operated cylinder 22 having a plug end portion 23 arranged to react against the flanged inner end portion 24 of the shackle leg 15 of the shackle 16. Said portion of the shackle leg 15 is in the form of a truncated inverted cone and is designated by the numeral 27. By comparing the retracted position of the shackle 16 in FIG. 1 with the protected position thereof shown in FIG. 3 it will be clear that the downwardly tapered portion 27 of the shackle leg 15 in moving through the flanged opening 13 therefor in the bearing plate 11' from the position of FIG. 3 to the position of FIG. 1, causes the clearance between the portion 27
of the shackle leg and the wall of the flanged opening 13 to become progressively reduced with the result that in the fully retracted position of the shackle there is a minimum of clearance as between the parts mentioned. This increases the effective tensile strength of the assemblage and will eliminate any tendency on the part of the shackle leg to cock, tilt, or wiggle laterally which would normally be brought about through the upward pressure applied by the spring 20. The close engagement as between the large diameter portion of the leg section 27 and the flanged opening 13 in the bearing plate 11', besides maintaining the retracted shackle in good upright alignment, insures a proper locking engagement as between the end portion 26 of the locking lever and the shackle to notch 18.

However, when the shackle leg moves outwardly for shackle releasing purposes, when it ultimately reaches the position shown in FIG. 3 with the leg enlargement 21 engaging the under-surface of the flange of the bearing plate 11', there is a maximum amount of clearance as between the extreme taper on the leg portion 27 and the stock surrounding the opening 13. This increase in clearance during the outward projection of the shackle assures free and easy movement of the shackle leg.

From the foregoing description it will be evident that, pursuant to the present invention, there is provided in a padlock, preferably of the laminated type, a shackle wherein the long leg thereof has its end portion of downwardly tapered formation, which, as explained above, increases the stability and alinement of the shackle heel when the shackle is in its retracted position, but facilitates freedom of movement thereof when the shackle moves toward its projected, unlocked position. The padlock shackle with a tapered leg is adaptable to various forms of padlocks, enhances the operation thereof, is simple and strong, and is otherwise well adapted for the purposes set forth.

What I claim is:
1. A padlock comprising: a case formed of a plurality of superimposed, secured together plates having aligned circular openings therein which form a cavity transverse to the planes of the plates, a first intermediate plate having the opening therein of substantially smaller circumference than those of the plates theretoparallel and having a relatively deep annular collar surrounding its opening and depending beyond a face of said plate into an enlarged circumference opening in an adjacent intermediate plate; and a shackle having a long leg reciprocatably extended into the cavity formed by said plate openings, an inner extent of said long leg of the shackle which extends through the restricted circumference opening in said first intermediate plate and its collar being inwardly tapered and of reduced diameter, the innermost extremity of said shackle long leg having an annular enlargement to engage the under-surface of said collar to limit the outward reciprocation of said shackle leg while maintaining a maximum amount of clearance as between the extreme tapered portion of said shackle leg and the reduced circumference opening in said first intermediate plate and its collar.

References Cited
UNITED STATES PATENTS
1,958,941 12/1933 Soref ----------------- 70—38
2,408,137 9/1946 Gray ----------------- 70—38
2,433,114 12/1947 Gray ----------------- 70—38
2,824,439 2/1958 Soref ----------------- 70—38
2,867,110 1/1959 Foote ----------------- 70—38

MARVIN A. CHAMPION, Primary Examiner
E. J. McCARTHY, Assistant Examiner

U.S. Cl. X.R. 70—53