Jan. 11, 1949. E. E. LAGERGREN 2,458,786

SKI TOWROPE GRIPPER

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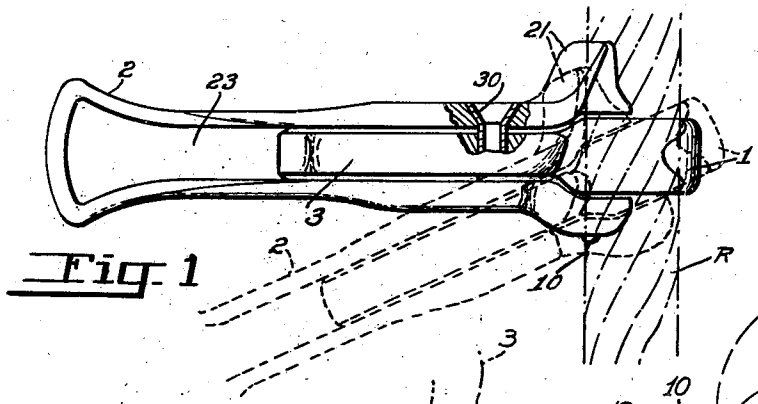


Fig. 1

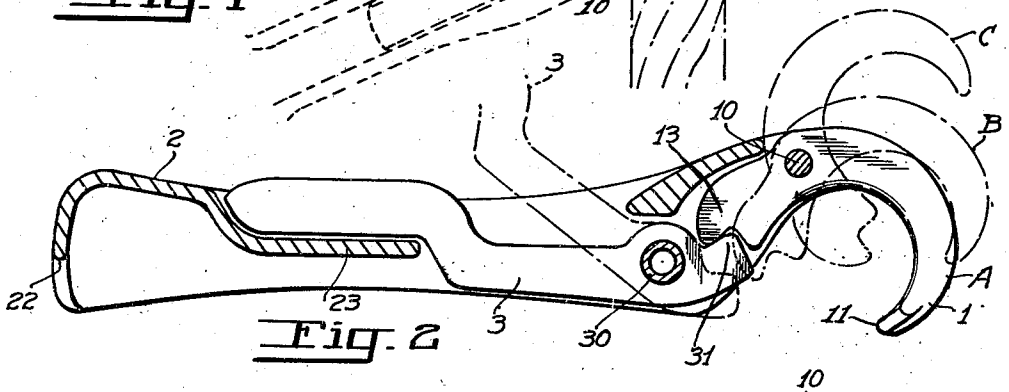


Fig. 2

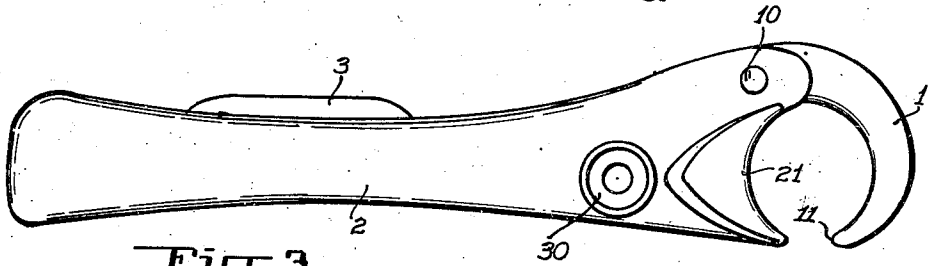


Fig. 3

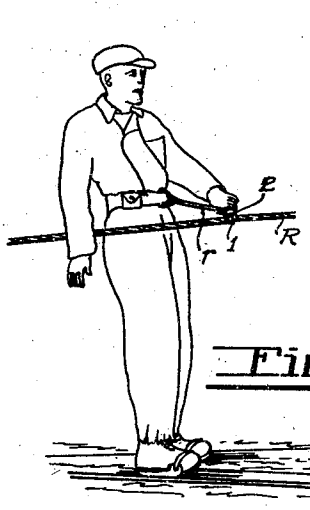


Fig. 6

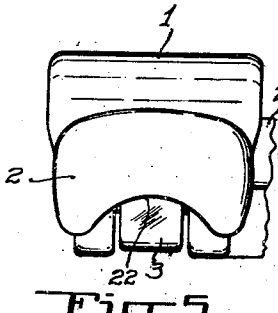


Fig. 5

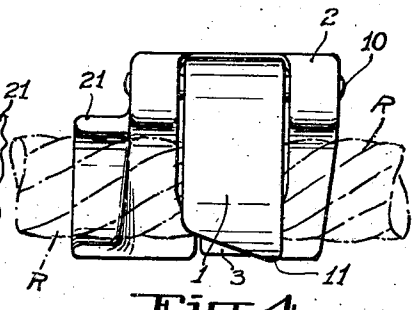


Fig. 4

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SKI TOWROPE GRIPPER

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9 Claims. (Cl. 104—202)

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The present invention concerns a device to enable a skier to grip a ski tow rope whereby the skier may be pulled uphill.

Such ski tow ropes are in widespread use at winter recreation areas, and skiers after sliding downhill are saved the slow and arduous task of climbing back up again, for they can be hauled to the top of the hill merely by grasping the tow rope which runs continuously up the hill. However, since it is very tiresome to hold on to the tow rope by the hands while being towed uphill, it is necessary to provide some means whereby the skier may more securely and with less effort grasp the tow rope. Nevertheless, such a gripping device must not only be readily engageable with the moving tow rope, but must be as easily disengageable, and indeed should be disengageable both at the will of the skier, and also automatically in case of a spill or similar accident, in order that the skier (who is connected to the gripping device by a short belt rope and thence to the tow rope by the gripping device) may not be pulled into the winding mechanism about which the tow rope runs at the top of the hill, or in the event of a spill on the way up be dragged along by the continuously running tow rope.

There have been devices intended to obtain the results already indicated, but such devices as have been available heretofore have in themselves had certain drawbacks. One such drawback is that these devices when released from gripping engagement with the tow rope are likely to be thrown, unless retained in the skier's grasp, by the forces reacting from the tow rope as they are disengaged, in such manner as to endanger the skier or persons nearby. One of the primary objects of the present invention is to provide a ski tow rope gripper which is readily engageable with the tow rope, easily held in operative position in engagement therewith, and yet which will automatically and with certainty release from the tow rope, except while the skier consciously desires to remain connected thereto, and without the production of forces tending to throw it or displace it violently, to the possible danger of persons nearby, or the skier himself.

It is also an object of the present invention to provide a device of this general nature which shall be not only strong and rugged, but capable of being formed of light weight and relatively small compass, so that it will be no burden to the skier when not in use.

It is a subsidiary object to provide such a gripping device which in its conformation is readily adapted to the preliminary operation of grasping the tow rope in the hands and then of transferring the grip from the hands to the gripping device.

Further objects, and particularly such as relate more specially to mechanical details, will be ascertainable from this specification as it progresses, from the accompanying drawings wherein the invention is shown in a presently preferred form, and from the claims at the end of this specification.

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Figure 1 is a bottom view of the device with a part broken away to illustrate a pivot connection, and with the device shown by broken lines in position for application to the tow rope.

Figure 2 is a longitudinal vertical sectional view through the device, showing various positions in full lines and in dot-dash lines.

Figure 3 is a side elevation of the device with parts shown in the operative position.

Figure 4 is an end view of the device looking at the gripping end and showing its relationship to a tow rope, and Figure 5 is an end view from the opposite end.

Figure 6 is a perspective view showing the manner in which the device is used by a skier.

The device comprises three principal parts, an elongated handle 2, a shackle 1, and a latch 3. These three elements are permanently connected to one another, and are each relatively movable. The handle 2 may be considered as the fixed element, however, and the shackle 1, which is of a size and shape to receive and embrace the tow rope R (Figure 4), is mounted upon one end of the handle for movement relative to the handle between an operative position and a releasing position. A pivotal mounting is shown, though some other type of relative movement could be employed instead. The pivot pin 10 is located between the ends of the shackle 1, and preferably nearer its inner end than its outer end, and is disposed transversely adjacent one end of the handle 2.

In the operative or rope-gripping position of the shackle 1, shown in Figure 3 and in position A in full lines in Figure 2, the rope is slightly constricted and cramped between the edge 11 of the shackle 1 and an offset extension 21 of the handle 2 which is spaced, longitudinally of the rope R, from the edge 11, and at the opposite side of the handle's median plane, from the latter. In this position of parts, the rope, pulling against the shackle 1 in the sense directed in line with but away from the handle 1, is unable to disengage from the shackle, for the shackle 1 and extension 21 cooperate to encircle the rope by more than a half-circle, and yet by inclining the entire device, in the direction opposite to its inclination while operatively engaged with the rope, and moving it transversely of the rope, the gap between the point of the shackle and the extension 21 is sufficiently wide to permit entrance of the rope. This will be explained in somewhat greater detail hereafter.

It follows that if the shackle is retained in this rope-gripping position, and if the nature of the

pull on the gripping device while engaged with the tow rope is such as to maintain the rope cramped, or to increase its tendency to be cramped, between 11 and 21, the gripping device will not be disengaged from the tow rope. In order to hold the shackle in this rope-embracing position, the latch 3 engages with the shackle and so retains the shackle.

The latch might be of any suitable form, and need not be pivotally mounted, though that is a convenient way of mounting it. Thus, the latch 3 is mounted by a hollow pivot pin 30, parallel to the pivot 10, and reasonably close to the latter, so that the latch lever 3 has a long arm and a short arm. The short arm 31 acts as a dog to engage the shoulder 13 at the inner end or shorter arm of the shackle 1, so long as the long arm of the latch lever extends (as shown in full lines in Figure 2) alongside the handle where it can be engaged by a hand which grasps the handle. So held—and but little effort is required so to hold it because of the great mechanical advantage of the lever system 1, 3—the latch lever 3 retains the shackle 1 in rope-engaging position against the forces reacting from the rope through the shackle, tending to urge the latch lever 3 to the open or dot-dash line position C of Figure 2.

It is evident that release of the shackle is readily accomplished when desired merely by releasing the latch lever 3, whereupon as soon as the latch lever reaches the position B in Figure 2 it is freed from further restraint, and the pull of the tow rope against the gripping device rotates the shackle to position C, whereupon the shackle freely releases itself from the tow rope R. This occurs while the handle 2 is still held securely in the hands of the skier. Nevertheless, should the skier stumble or fall and release the handle 2, the release of the shackle 1 automatically occurs; it is impossible to retain the gripper in engagement with the tow rope if the lever 3 is released, for there is then no resistance to the shackle-opening force of the rope.

The hollow pivot at 30 is provided for the purpose of securing a belt rope *r*, the other end of which is secured to the belt of the skier. Such an anchorage might be located elsewhere, but this has been found a convenient location.

In using the device the skier stations himself alongside the moving tow rope R. In one hand he holds the gripper, which is in the operative position of Figure 3. He now grasps the moving rope with both hands, and in so doing lays the gripping device, particularly the handle 2, with its groove 22, longitudinally alongside the tow rope, and encompasses the handle 2 and rope R within the grip of his hand. By grasping the rope firmly the skier thus accelerates himself until he is moving at the same speed as the rope. Now, at the first opportunity the skier quickly removes his one hand, and the gripper, from the rope, and places the gripping device at an angle directed forwardly of a perpendicular to the tow rope, and hooks the end of the shackle, still held in its inoperative or latched position A, over or under the rope, in such manner as to cramp the rope slightly between the edge 11 and the lateral extension 21 when the natural pull on the handle inclines it rearwardly. This natural pull of the belt rope *r* serves to maintain the gripping device at such angle, nearly perpendicular to but inclined somewhat rearwardly relative to the run of the tow rope R, that the gripping device may not slip from the tow rope, but the tow rope is rather held cramped somewhat. The skier is thus towed along, mainly by means of the belt rope *r*, and needs only apply such force to the handle 2 and to the latch 3 as will hold the latch secure against the stop 23 of the handle. Very little effort is required because of the large mechanical advantage in the leverage. As soon as the skier desires to release the tow rope, he needs only release the latch 3, whereupon the forces acting upon it through the shackle, and which bias the latch to move to open position, actually move it to open position, releasing the shackle and permitting the latter to move through the position B to the released position C, whereupon the rope R immediately slips from the shackle, being no longer held between the shackle and the extension 21.

It will be evident that the skier retains the gripping device, through the handle 2, within his grasp at all times, and that no forces are developed by the release of the gripping device from the tow rope tending to throw the gripping device as a whole out of the grasp of the skier. All such forces act only to rotate the shackle to releasing position. The device may be made from light, yet strong metal, as for instance aluminum or aluminum alloy castings, and the forces developed by the movement of the shackle to releasing position or by the coincident moving of the latch are but slight. The device will retain itself automatically in engagement with the tow rope so long as the latch holds the shackle in tow rope-engaging position, the position A of Figure 2, yet will always and automatically release the tow rope as soon as the latch is released.

In particular it should be noted that the rope-engaging operation is effected after the parts are in rope-secured or latched position, and no closing of jaws to pinch the moving rope, or latching operation after engagement, is required. The engaging operation is one of entering the tow rope through an entrance gap which is always large enough to pass the rope, but which will pass it only if the handle and gripper as a whole are inclined forwardly of the position in which they are disposed while they pull the skier along; in this latter rearwardly inclined position the rope is deflected and encircled about a substantial part of its circumference, by the cooperation between the edges 11 and 21 which nevertheless are widely spaced lengthwise of the rope R.

The relationship of gripper to tow rope during initial engagement is shown in Figure 1 by broken lines.

I claim as my invention:

1. A ski tow rope gripping device comprising a shackle formed to receive and embrace, or to release, the tow rope; an elongated handle at one end whereof said shackle is mounted for movement between an operative or rope-engaging position, and a rope-releasing position, said handle being formed, in cooperation with the shackle when the latter is in operative position, to cramp and bind the tow rope at points spaced along the rope, and also being cooperatively formed to define an entrance aperture intermediate such points, which aperture is angled relative to the handle, and of a size to admit the rope when the handle is thus angled relative to the rope; and latch means interconnecting the shackle and the handle to retain the shackle in operative position, said latch means being formed, relative to the handle and shackle, to be biased by forces reacting from the tow rope through the shackle for movement from latched to shackle-released position, thereby to permit automatic movement

of the shackle into rope-releasing position under the influence of such forces, yet to be retained, by a hand which grasps the handle, in latched position.

2. A ski tow rope gripping device as in claim 1, wherein the shackle is pivotally mounted between its ends, upon an end of the handle, the handle extending away from its shackle-mounting and rope-binding end, for grasping, and the latch including a hand-grasped portion disposed, when in latching position, along said handle.

3. A ski tow rope gripping device as in claim 1, wherein the latch is formed as a lever pivoted near one end upon the handle, the short end of said latch being engageable with the shackle to retain the shackle in operative position, and the long end of the latch, while in latching position, extending along the handle for grasping by the hand which grasps the handle.

4. A ski tow rope gripping device as in claim 1, wherein the shackle is pivotally mounted between its ends, upon an axis located in one of its arms and transverse to the length of the handle, near one end of the latter.

5. A ski tow rope gripping device as in claim 1, wherein the notched shackle is pivotally mounted between its ends, and upon an axis located in one arm of its notch and transverse to the length of the handle, and near one end of the handle, the latch being formed as a lever pivoted near one end upon the handle, the short end of said latch lever being engaged with the short end of the shackle to retain the shackle in operative position, and the long end of the latch, while in latching position, lying along the handle in position for grasping by the hand which grasps the handle.

6. A ski tow rope gripping device as in claim 1, wherein the shackle and rope-engaging portion of the handle are relatively formed and arranged, when the shackle is in operative position, to define an angled entrance gap of a size to admit the rope when the handle is disposed at one angle thereto, and thereafter to bind the rope when the handle is swung by the towing forces, to a different angle.

7. A ski tow rope gripping device comprising an elongated handle formed at one end, with an integral seat offset from a median longitudinal plane of the handle, to engage one side of a tow rope; a shackle pivotally mounted upon said handle, on an axis generally parallel to the run of the tow rope, and adjacent said seat, said shackle being formed, relative to said seat, to engage the opposite side of the tow rope from said seat, at a point at the opposite side of the median longitudinal plane from such seat, thereby to cramp the rope therebetween, and when in rope-engaging position having its end inwardly swung to cooperate with the seat in embracing the rope about more than a half-circle, but spaced from the handle sufficiently to admit the rope therebetween when the handle is disposed angularly relative to the rope, and latch means including a portion lying alongside the handle and extending away from the shackle, said latch means being mounted upon and for movement relative to the handle, and engageable with the shackle to retain the latter in rope-engaging position, but upon release releasing the shackle for movement into outswung position, under the influence of the rope-engaging forces.

8. A ski tow rope gripping device comprising a handle which in operation is disposed generally horizontally and projecting laterally and somewhat rearwardly from the tow rope, an offset extension at and rigid with the rope-engaging end of the handle for positioning ahead of or behind the handle and alongside the tow rope, to deflect the rope upon application of a force to the handle, by reason of its offset location, a shackle pivotally mounted upon and in line with the handle, and of substantially arcuate shape, to encircle the tow rope, and to complete, with said extension, encirclement thereof in excess of a half-circle, and under the influence of the same force to deflect the encircled rope oppositely to the extension, the shackle and the extension being shaped and spaced to provide an entrance gap of such size that, when the handle projects laterally and forwardly of the rope, the rope may enter such semicircular notch of the shackle, and latch means including a hand-grasped portion lying alongside the handle, engageable with the shackle to hold the latter in closed operative position, and biased by the rope's force acting upon the shackle for movement into shackle-released position, to free the shackle for pivotal movement into open position, away from said extension.

9. A ski tow rope gripping device comprising an elongated handle having a concave-endwise head portion at one end thereof adapted to engage one side of a tow rope at a location spaced laterally of the handle's longitudinal midplane, a shackle member movably mounted in the same end of the handle and movable between rope-engaging position engaging the side of the tow rope opposite from said head portion, and rope-releasing position moved outwardly from said head portion, said shackle member in rope-engaging position contacting the rope at a location spaced lengthwise of the rope from said first location of its engagement with the head portion, whereby inclining the handle with respect to the rope effects deflection of such rope between such locations, and hand-held latch means independently pivoted to the handle and engageable with said shackle member to latch such member in rope-engaging position, said latch means having a lever-arm adapted to be held in the hand grasping the handle, release whereof releases said latch means to release said shackle element and thereby the tow rope, such release of the rope being effected immediately thereupon by the restoring force of the tow rope urging said shackle member away from said head portion during use of the device in towing with the handle projecting from the tow rope.

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