

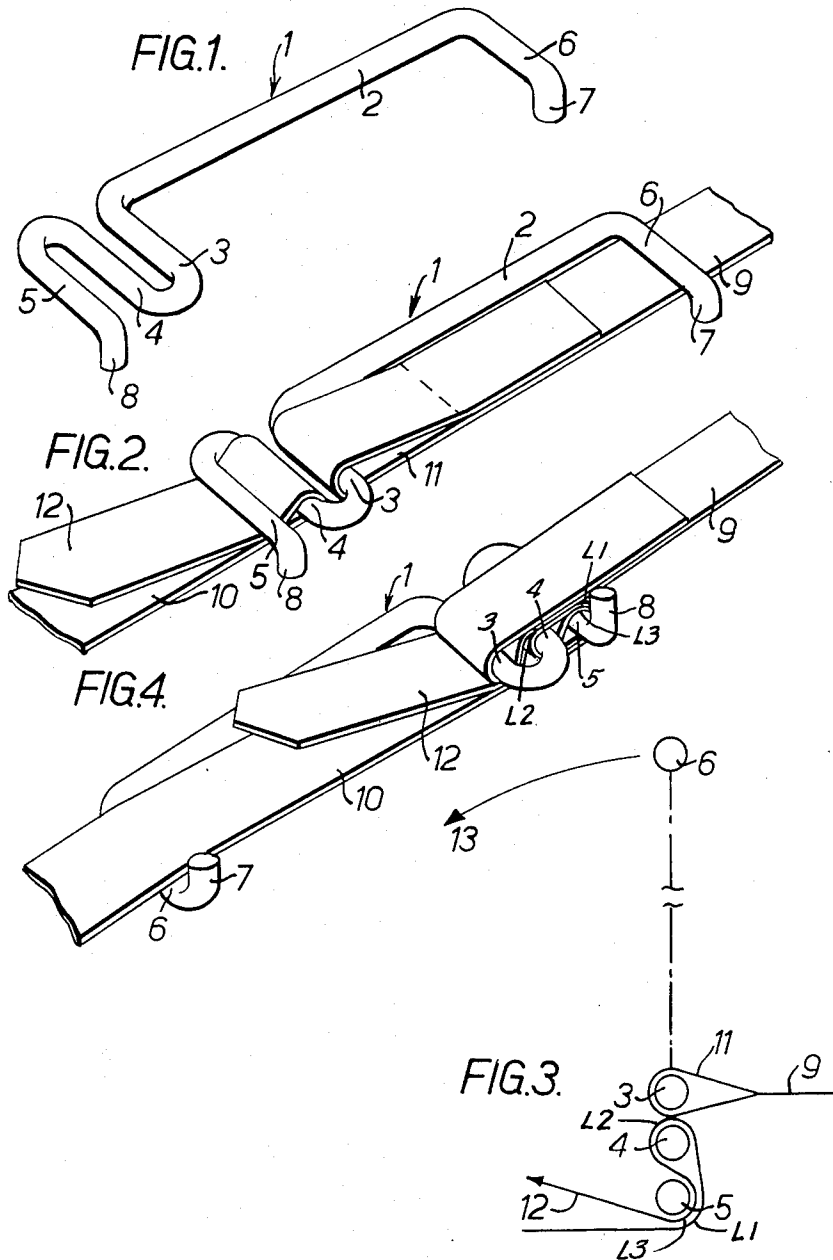
Aug. 31, 1965

T. A. G. ROING  
TIGHTENING DEVICE

3,203,058

Filed Nov. 21, 1963

2 Sheets-Sheet 1



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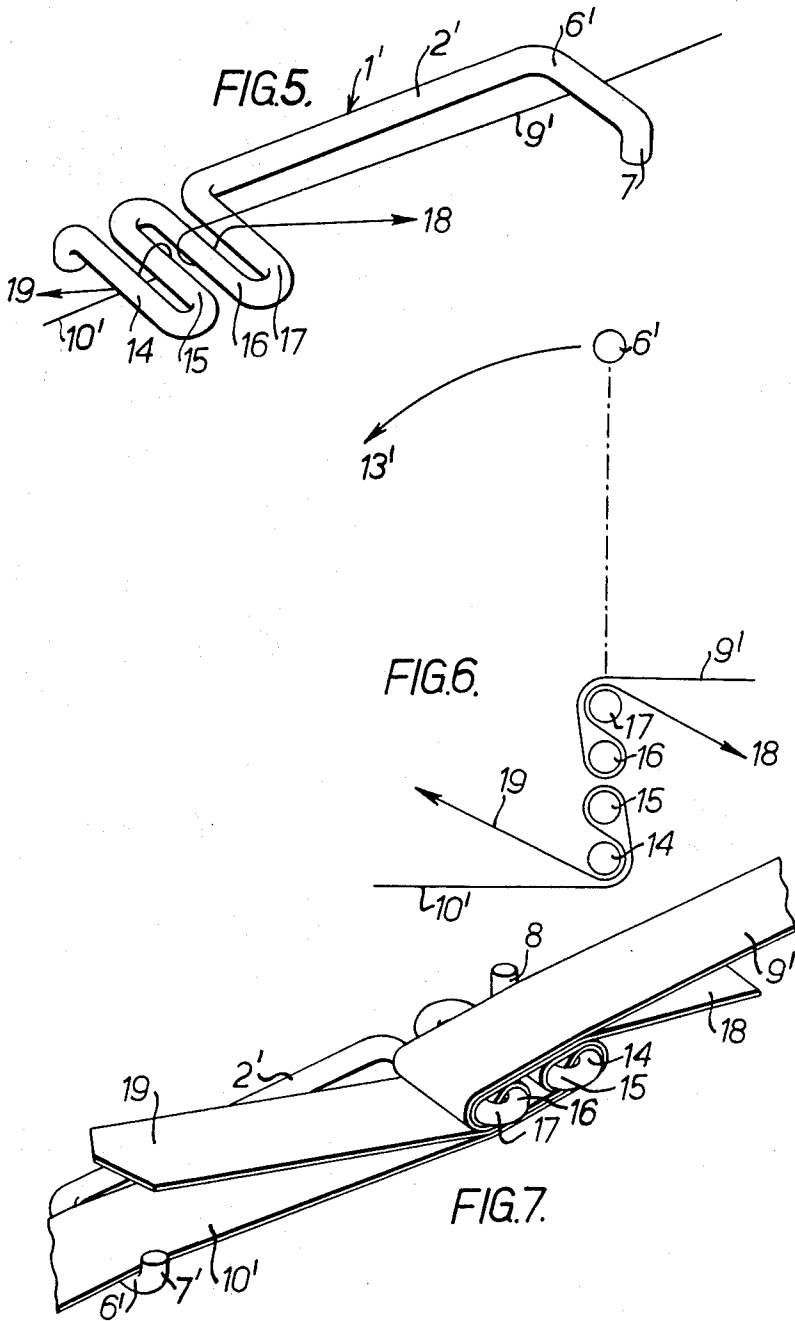
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**TIGHTENING DEVICE**

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1 Claim. (Cl. 24-68)

This invention relates to a device suitable for tightening and securing strapping applied around one or more articles to hold it or them together and/or in place. The device is intended for use in securing an article or articles during handling e.g. during transportation, and especially when it is desired to permit a quick and simple tightening and releasing of the strapping. Often goods cannot be secured firmly enough to prevent shifting merely by pulling on the strapping being used, and the present invention seeks to provide a tightening device with a lever arm, which on manual operation applies a tightening force to the strapping.

According to the present invention, a device suitable for tightening and securing strapping comprises at least two parallel arms spaced from one another and attached to a lever adjacent one end thereof, said arm being adapted to be engaged with the strapping whereby, upon movement of the lever to reverse the position of the arms the strapping is folded up upon itself and thereby shortened.

The device may include three parallel arms, an adjacent pair of said arms being adapted to be entwined with one end of the strapping and the third arm being adapted to be engaged with a loop formed at the other end of the strapping, whereby upon movement of the lever to reverse the position of the arms the ends of the strapping are brought together and overlapped.

Furthermore the device may include four parallel arms, one pair of adjacent arms being adapted to be entwined with one end of the strapping, and the other pair of adjacent arms being adapted to be entwined with the other pair of adjacent arms, whereby upon movement of the lever to reverse the position of the arms, the ends of the strapping are brought together and overlapped.

Examples of the invention are now described with reference to the accompanying drawings, in which:

FIG. 1 is a perspective view of one embodiment of the device.

FIG. 2 shows a perspective view of said device of FIGURE 1 after it has been initially engaged with the strapping.

FIG. 3 is a diagrammatic view showing the device of FIGURE 2 during manipulation to tighten the strapping.

FIG. 4 is a perspective view showing the device and strapping in the tightened and fastened position.

FIG. 5 shows a perspective view of another embodiment of the device after it has been initially engaged with the strapping whose position is indicated diagrammatically by a single line.

FIG. 6 is a diagrammatic view showing the device of FIGURE 5 during manipulation to tighten the strapping.

FIG. 7 is a perspective view showing the device of FIGURE 5 and strapping in the fastened and tightened position.

The tightening device 1 has a lever part 2 and parts 3, 4 and 5 formed integrally by bending a rod into double U-shaped curves. The free end of the lever 2 is bent to provide a cross shaft 6. The extreme ends of the arm 5 and shaft 6 are bent at right angles to form stubs 7 and 8, so that the strapping is prevented from slipping sideways off the arms.

The purpose of the device is to pull the strapping ends

9 and 10 together, and to hold them in a tightened position. One end 9 of the strapping has a loop 11, the other 10 a free end 12.

The loop 11 is pulled over the shaft 6 and the lever 2 and is placed round the arm 3. The strapping 9 passes under the shaft 6 whose end 7 engages with one edge of the strapping, the lever 2 lying alongside the other edge thereof. The end 12 of the strapping 10 is placed under the two arms 5 and 4, around the arm 4 and back under the arm 5, where it is prevented from slipping sideways by the stub 8.

When the strapping end 12 is pulled by hand, strapping will be drawn around the arms 4 and 5, and partially tightened.

Further tightening is achieved when the device is turned over as shown in FIG. 3 so that the shaft 6 moves in the direction of the arrow 13, until the tightened position, see FIG. 4, is reached with the shaft 6 placed under the strapping 10. The compressive force between the strapping 10 and its end 12 is then sufficient to frictionally secure the strapping 10.

As is clear from FIGURES 3 and 4, when the tie is tightened the strap portion 10 extends past all of the arm parts 3, 4 and 5 in that order, thence around the arm 5 in a first loop L1, thence to and around the arm 4 in a second loop L2, thence between the arms 4 and 5 back to and around the arm 5 in a third loop L3. The third loop L3 is within the first loop L1 and is sandwiched between the first loop and the arm 5. The strap portion 10 then extends from the third loop L3 and arm 5 past the arms 4 and 3 in that order.

To release the tension the device is returned to the position of FIG. 2.

FIGS. 5 to 7 show a tension device 1' with four arms 14, 15, 16 and 17. The purpose of this device is to fasten and tighten two free strapping ends. One strapping end is marked 9' and the other 10'. The strapping 9' is placed under the shaft 6', over the two arms 17 and 16, down round arm 16 and back up over arm 17. The free end 18 emerges then under strapping 9'.

The strapping 10' is placed under the two arms 14 and 15, up around arm 15 and back under arm 14, so that the free end 19 comes out over the strapping 10'.

To tighten the fastening one or other, or both strapping ends 18, 19 are pulled by hand, to draw the strapping around the arms and take up any slack. After that the device is turned over as shown in FIG. 6 so that the shaft 6' moves in the direction of the arrow 13'. This tightens the strapping in like manner as hereinbefore described with reference to FIGURES 1-4.

When the lever 2' has been turned to the tightened position shown in FIG. 7, the shaft 6' is placed under the strapping 10', and the shaft end stub 7' prevents the strap-straight strap engaging part, said rod being bent upon it-ping ends 18 and 19 are twisted round the arms 14, 15, 16 and 17, so that the strapping is frictionally secured against slipping. To release the tension the device is turned back to its first position as shown in FIG. 5.

What is claimed is:

In a tightened strap tie comprising aligned first and second strap portions, a strap tightening and fastening device comprising an integral rod having a straight elongated portion forming a lever, said rod at one end of said lever being bent transversely thereof to form a first straight strap engaging part, said rod being bent upon itself in a loop at the end of said first part and extending parallel to and spaced from such part to form a second strap engaging part, said rod being bent upon itself to form a loop at the end of said second part remote from said first loop and then extending transversely of the strap to form a third strap engaging part, said parts lying in a common plane with said lever, said rod at the other end

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of said lever being bent transversely to form a fourth strap engaging part parallel to said first, second and third strap engaging parts, the extremities of said third and fourth parts being bent to form stubs, said first strap portion extending past all of said first, second and third parts in that order, thence around said third part in a first loop, thence to and around said second part in a second loop, thence between said second and third parts back to and around said third part in a third loop within said first loop, said third loop being sandwiched between said first loop and said third part, and thence past said second and first parts in that order, said second strap portion being connected to said first part and bearing against said second loop in said first strap part.

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