Aug. 19, 1924. 1,505,754

S. J. TURNER

STRAP ACTUATING APPLIANCE

Filed Jan. 19, 1920 2 Sheets-Sheet 1

Fig. 1.

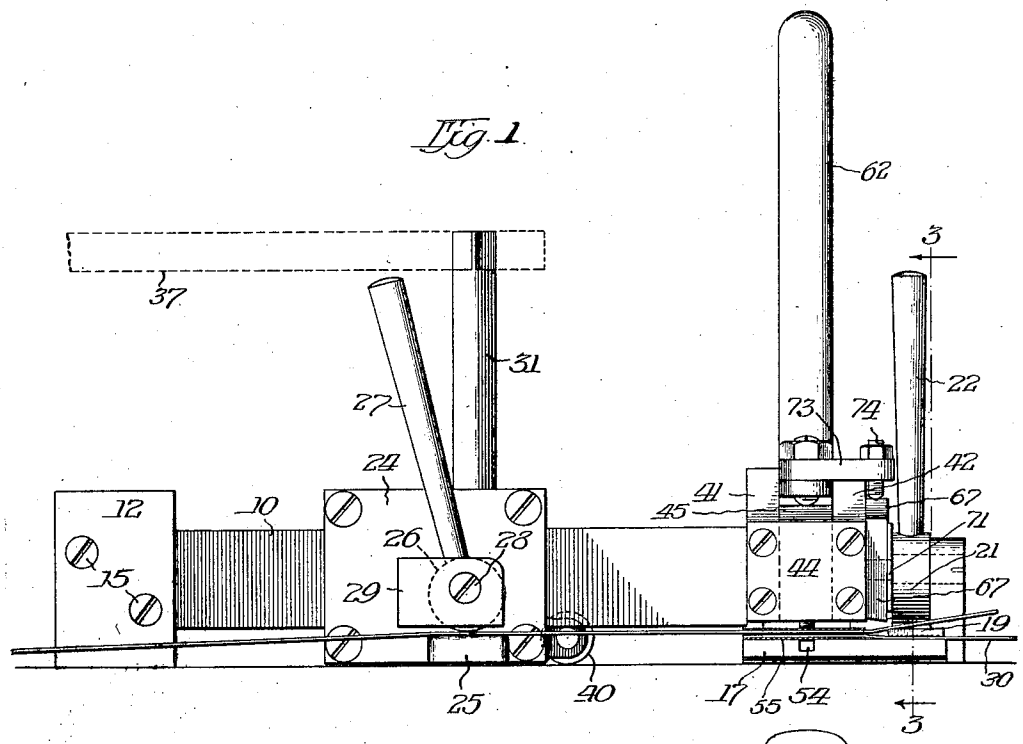
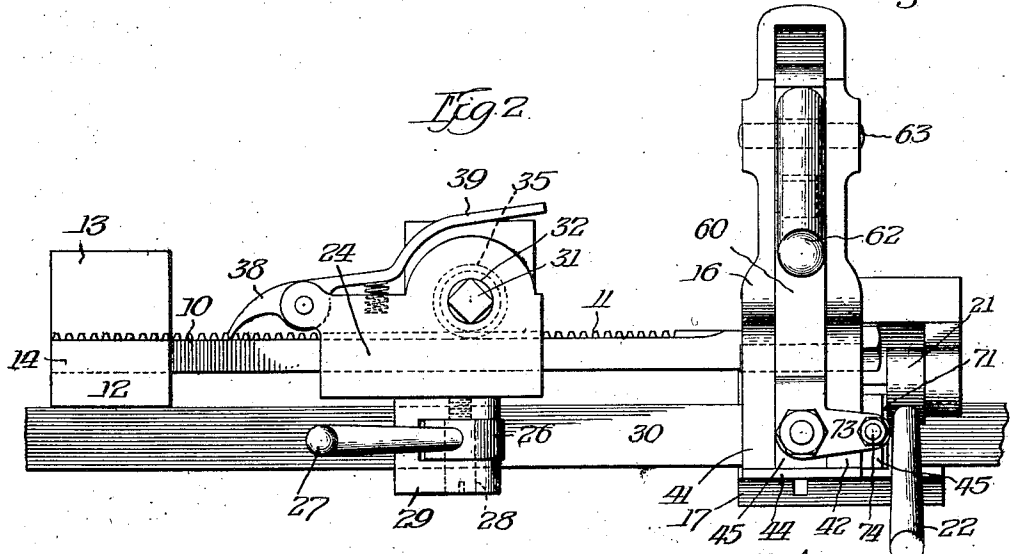


Fig. 2.



Otto Rabe and
The Northern Trust Company
Executors of the estate of
Samuel J. Turner
By Walter M. Fuller Atty

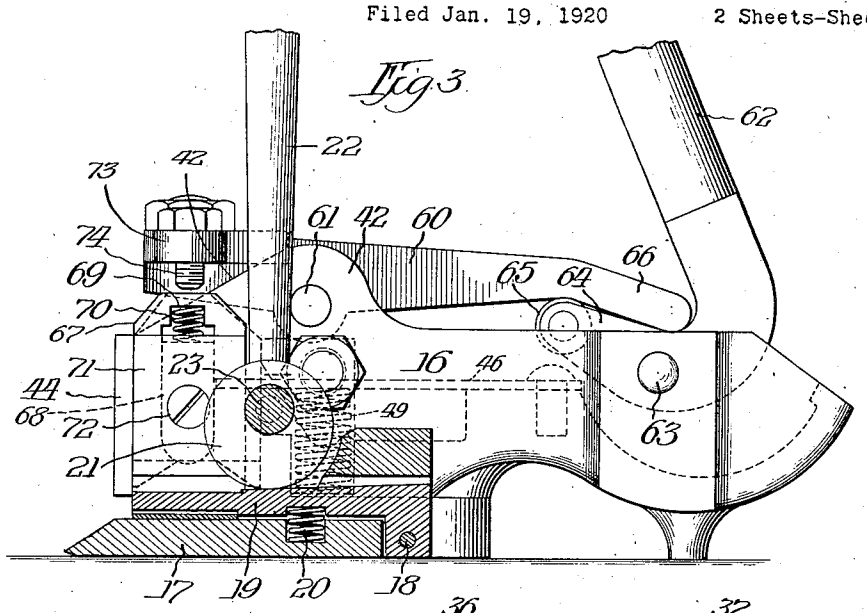
Aug. 19, 1924. 1,505,754

S. J. TURNER

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Filed Jan. 19, 1920 2 Sheets-Sheet 2

Fig. 3



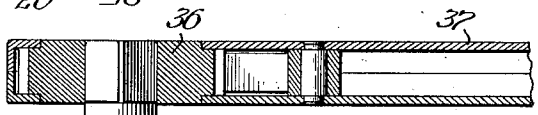


Fig. 4

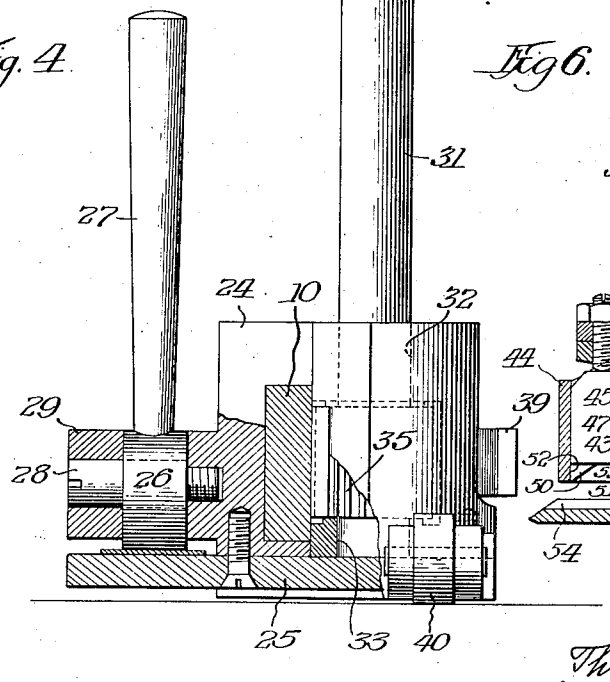


Fig. 6.

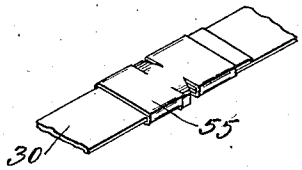
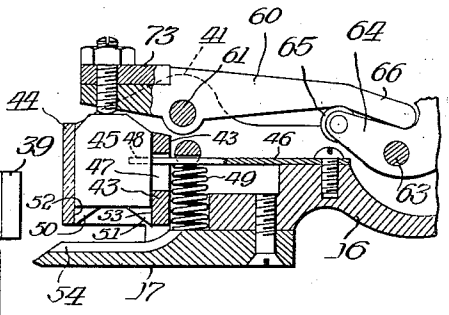


Fig. 5.



Otto Rabe and
The Northern Trust Company
Executors of the estate of
Samuel J. Turner
By Walter M. Fuller
Atty.

Patented Aug. 19, 1924. 1,505,754

UNITED STATES PATENT OFFICE.

SAMUEL J. TURNER, DECEASED, LATE OF CHICAGO, ILLINOIS; BY OTTO RABE AND THE NORTHERN TRUST COMPANY, EXECUTORS, ASSIGNORS OF ONE-HALF TO SAID OTTO RABE, OF WILMETTE, ILLINOIS.

STRAP-ACTUATING APPLIANCE.

Application filed January 19, 1920. Serial No. 352,510.

To all whom it may concern:

Be it known that OTTO RABE, a citizen of the United States, residing at Wilmette, county of Cook and State of Illinois, and THE NORTHERN TRUST COMPANY, a corporation duly organized and existing under and by virtue of the laws of the State of Illinois, and having its principal office and place of business and post-office address at La Salle and Monroe Streets, in the city of Chicago, county of Cook, State of Illinois, have been duly appointed joint executors of the last will and testament of SAMUEL J. TURNER, late a citizen of the city of Chicago, county of Cook, State of Illinois, deceased, and declare that said SAMUEL J. TURNER, prior to such decease, invented certain new and useful Improvements in Strap-Actuating Appliances, of which the following is a specification.

The present invention relates to structural and functional improvements in devices for applying, holding, and confining metal bands, straps, etc. to boxes, cartons, bales, and similar bodies, for strengthening purposes.

Its leading object is the production of an appliance of this type which will stretch or tighten a metal band or ribbon around the body, cut it off from a supply strip, and apply a clip or fastener thereto in such a way as to maintain it taut and its ends from separating.

A further purpose of the invention is the provision of an apparatus of this character comprising few parts inexpensive to make, which performs its work with facility and ease of operation and which will successfully withstand the more or less rough usage to which such appliances are likely to become subjected.

In order that those skilled in this art may have a full and complete understanding of the invention, a preferred and desirable embodiment of the same has been illustrated in the accompanying drawings, forming a part of this specification, and to which reference should be had in connection with the following detailed description of the device, like reference characters referring to the same parts throughout the several views.

In these drawings:

Figure 1 shows the improved appliance in elevation in association with a metal strap to be tightened, the removable operating handle being illustrated in dotted lines;

Figure 2 is a plan view of the parts shown in Figure 1 except that the handle referred to is omitted;

Figure 3 is an enlarged cross-section on line 3—3 of Figure 1;

Figure 4 is a fragmentary section;

Figure 5 is a cross-section showing the punch operating mechanism; and

Figure 6 is a perspective view of the joint for the metal band.

Referring to the drawings, it will be perceived that the improved and novel device comprises a longitudinal rack-bar 10 disposed edgewise, that is, with its teeth 11 arranged vertically on one upright face thereof, this being the back or rear face as the appliance is viewed in Figures 1 and 2. Such bar is supported at one end on a block 12 having an enlarged flat supporting face 13 adapted to rest on the box, carton, bale, or the like, and a top portion 14 overlying the upper edge of the bar, the latter fitting snugly between these two vertically-separated parts of the block, to which it is securely fastened by screws 15, 15.

The opposite end of such rack-bar is fixed in any approved manner to a casting 16 of irregular shape or form which has a marginally-beveled shouldered die-plate 17 fastened to its under face by means of suitable screws. Such end member carries the means for fastening the overlapped parts of the strap together by a suitable clip, means for holding one of the strap sections during the stretching or tightening action, and a cutter to sever the used portion of the strap or band from the supply roll.

Hinged at 18 (Figure 3) in a recess of the die-plate 17, a clamp-plate 19 is employed normally pressed up by a short coil-spring 20 seated in matching sockets or cavities of the two elements 17 and 19, all as is clearly illustrated. The front portion of such clamp-plate above the reduced thickness part of the die-plate is roughened on its under surface (Figure 1). The end of the

strap 30 is adapted to be clamped or gripped during the tightening or stretching operation between such clamp-plate and the die-plate, and, to hold the former in such strap-gripping position, the cam or eccentric 21, with an operating-handle 22, is rockingly mounted on a shaft or screw 23 supported by suitably-shaped parts of the casting. Obviously, by turning the handle and cam, the clamp-plate may be depressed against upward pressing action of its spring and firmly bind the metal strap or ribbon 30 between its under roughened face and the upper surface of the die-plate, as is fully illustrated in Figure 1.

In order to grasp another portion of the strap or band to stretch or tighten it about the body which it encircles, a block 24 is used through which the rack-bar extends and on which the block may slide. A clamp-plate 25, by screws is fastened in a lateral or cross recess or groove in the bottom face of the block and extends forwardly beneath a clamping cam or eccentric 26 equipped with an operating handle 27 and rockingly mounted on a shaft or rod 28 supported in the main body of the block and in an integral angle-bracket 29. It will be perceived that, as is clearly illustrated, the pair of band clamps 19, 17 and 26, 25 are in alignment or register and that the metal strap or ribbon 30 extends from a supply-roll (not shown) over the clamp-plate 19, then between the clamping elements 25 and 26 and encircling the body to be bound, the ends of such band or ribbon being firmly held between the elements 19 and 17. Owing to the beveling of the edge of the die-plate 17 and of the clamp-plate 25, this appliance may be easily applied transversely to the band or strap which it is to operate.

In order to slide the member 24 along the rack-bar toward the end casting 16 to stretch or tighten the band or strap around the body which it encircles, the following cooperating instrumentalities are supplied.

A vertical shaft 31 has an upper bearing 32 in the top horizontal wall of the block member or sliding gear-case 24 and a lower bearing 33 supported by the removable clamp-plate or bar 25, and inside of such reciprocatory element 24 it is fitted with a gear or pinion 35 having its teeth in mesh with those of the stationary rack-bar 10. The top end of such shaft is angular, square for example, in cross-section, and is fitted on such part with a removable or demountable ratchet socket 36 operated in one direction only by a horizontal handle 37.

Such sliding block or gear-case 24 is additionally supplied with a pivoted spring-pressed pawl or dog 38 adapted to engage the teeth of the rack over which it readily rides during the travel of the member in one direction on the rack-bar preventing a reverse movement of such sliding member. Thus, when the ratchet-handle 37 is rocked back to get a new hold on the vertical shaft, retrograde movement of the sliding block or loosening of the partly-tightened strap is prevented by the co-action of the dog or pawl 38 with the teeth of the rack-bar. Such pawl has a tail or finger-piece 39 which may be manually pressed to release it from the rack when it is desired to restore the sliding block to its original position, ready for stretching the next strap.

In some instances, the surface of the box, carbon, or other body to which the confining strap or band is applied may be somewhat rough or uneven and to facilitate the sliding movement of the block 24 it is fitted with an anti-friction roller 40 adapted to travel on such surface. If desired, such roller may extend downward slightly below the bottom faces of the base 13 and the die-plate 17, as will be readily understood, to render the travel of such block more free and easy.

The casting 16 has a pair of spaced walls 41 and 42, a cross-wall 43, and a removable front-plate 44 forming between them a guiding passage for a vertically-sliding punch 45 normally held in elevated position by a leaf-spring 46 secured at its rear end to a horizontal wall of the casting with its front end projecting through a hole 47 in the wall 43 and extending into an aperture 48 in the punch. If desired, the lifting action of such leaf-spring may be supplemented or augmented by a suitably-positioned coil spring 49 below it. On its lower end such punch has a pair of oppositely-beveled teeth 50 and 51 with outer straight edges 52 and 53 in alignment or register with the front and rear plane surfaces of the punch. When the latter is depressed by means described hereinafter, such teeth or lugs enter a registering straight groove 54 cut in the top face of the underlying reduced-thickness portion of the die-plate 17 and cut a pair of parallel slits in each of the two opposite edges of the strip 55 and the overlapped parts of the strap in such clip, at the same time deforming or pressing downwardly out of their normal planes the tongues of metal of both strap and clip between such cuts, thereby locking the parts or sections of the strap together and to the clip enclosing them.

To operate or depress such punch, a bent lever 60 is fulcrumed on a pin or shaft 61 supported in holes in walls 41 and 42, and such lever or rock-arm is actuated by a bell-crank handle 62 fulcrumed between the same spaced walls on a pin 63, the shorter arm 64 of such bell-crank having an anti-friction roller 65 adapted to travel on the lower face of the downwardly-bent part 66

of the lever 60. Obviously, as the handle 62 is swung rearwardly, the lever 60 will be rocked on its fulcrum and will cause the downward sliding movement of the punch, all as will be readily understood.

It is desirable also to cut off the tightened clamped strap from the supply, and, accordingly, a vertically-slotted cutter or shear-blade 67 is mounted for and guided in its upright reciprocations on the casting 16. To this end the casting has a rectangular guiding projection or rib 68 over which the blade fits and between the upper ends of the projection and the slot 69 of the blade a coil-expansion-spring 70 is interposed, whose function and purpose is to lift or elevate the blade when permitted to do so. The blade is maintained in proper relation with its guiding-projection by a cover-plate 71 fastened to the rib 68 by a screw 72.

This blade, during the strap shearing operation co-operates with the adjacent edge of the clamp-plate 19 and in order that it may be depressed or slid downwardly at the proper moment, the bent lever 60 which overlies the sliding punch 45 is provided with a lateral extension 73 fitted with an adjustable screw 74 adapted to engage the top end of the blade during the operation of the lever, all as will be readily understood.

As will be readily understood from the above description, the operation of the device occurs practically as follows:

Assuming that the end of the strap 30 is clamped between the parts 17 and 19, that the strap extends around the body to be bound, that such strap is gripped between the elements 25 and 26, and that the overlapped parts of the strap are fitted with a sheet-metal clip 55 of any suitable form and style, the operator then swings the handle 37 back and forth in a horizontal plane, causing the movement of the member 24 toward the casting 16, thereby tightening the strap, and, when this latter operation has been completed, handle 62 is swung rearwardly in its vertical plane, causing the downward sliding of the punch which slits and deforms the metal of the strap and clip thereby locking them together, and, at the proper moment, the shear-blade is depressed, cutting off the strap from the supply. Then the appliance is removed sidewise from the stretched and joined strap or band.

To those skilled in this art it will be clear that many minor mechanical changes may be made in the structure presented without departure from the heart and essence of the invention and without the sacrifice of any of its substantial benefits and advantages.

Claims:

1. In an appliance of the character described, the combination of means to tighten a strap around the body to be confined thereby, means to lock overlapped parts of the tightened strap together, means to sever the used section of the strap from its stock supply, and operating means common to said locking and severing means, substantially as described.

2. In an appliance of the character described, the combination of means to tighten a strap around the body to be confined thereby, means to lock a clip to overlapped parts of the tightened strap, means to sever the used section of the strap from its stock supply, and operating means common to said locking and severing means, substantially as described.

3. In an appliance of the character described, the combination of means to tighten a strap around the body to be confined thereby, means to lock overlapped parts of the tightened strap together, means to sever the used section of the strap from its stock supply, and an operating means common to said locking and severing means including a bent lever and a co-operating bell-crank handle to actuate said lever, substantially as described.

4. In an appliance of the character described, the combination of means to tighten a strap around the body to be confined thereby including an abutment plate, a combined shear and clamp-bar, means to operate said clamp-bar to grip the strap between it and the abutment plate, and severing means co-operating with said bar to cut off the strap from its stock-supply, substantially as described.

5. In an appliance of the character described, the combination of means to tighten a strap around the body to be bound thereby including an abutment plate, a pivoted combined shear and clamp-bar, an eccentric to operate said clamp-bar to grip the strap between it and the abutment plate, and severing means co-operating with said clamp-bar to cut off the strap from its stock supply, substantially as described.

6. In an appliance of the character described, the combination of means to tighten a strap around the body to be bound thereby including an abutment plate, a combined shear and clamp-bar, and means to operate the clamp-bar to grip a portion of the strap between itself and the abutment plate, means to lock overlapped parts of the tightened strap together, severing means co-operating with said bar to sever a portion of the strap positioned on the side of the bar opposite said abutment plate, and operating means common to said locking and severing means, substantially as described.

7. In an appliance of the character described, the combination of means to tighten a strap around the body to be bound thereby, including an abutment plate, a combined shear and clamp-bar and an eccentric to

operate the clamp-bar to grip a portion of the strap between itself and the abutment-plate, and means to sever a portion of the strap above the clamp-bar including a sliding shear member co-operating with said combined shear and clamp-bar, substantially as described.

8. In a strap tightening device of the character described, the combination of a horizontal rack-bar disposed edgewise vertically, means secured to said bar to clamp a portion of the strap to be tightened, a member slidable on said rack-bar toward and from said clamping means, a strap clamping means on said slidable member, a gear on said member in mesh with the teeth of said rack-bar, means to operate said gear to slide said member, and a pawl on said slidable member coacting with the teeth of said rack-bar, substantially as described.

9. In a strap tightening device of the character described, the combination of a horizontal rack-bar disposed edgewise vertically, means secured to said bar to clamp a portion of the strap to be tightened, a member slidable on said rack-bar toward and from said clamping means, a strap clamping means on said slidable member, a gear on said member in mesh with the teeth of said rack-bar, ratchet means with a horizontal handle to operate said gear, and a spring-pressed releasable pawl on said slidable member co-acting with the teeth of said rack-bar, substantially as described.

10. In a strap tightening appliance of the character described, the combination of a horizontal rack bar disposed edgewise vertically, means secured to said bar to clamp a portion of the strap to be tightened, a member slidable on said rack-bar toward and from said clamping means, strap clamping means on said slidable member, a gear on said member in mesh with the teeth of said rack-bar, a horizontal handle to operate said gear, and a pawl on said slidable member co-acting with the teeth of said rack-bar, substantially as described.

11. In an appliance of the character described, the combination of means to tighten a strap around the body to be bound thereby, a handle operable in a horizontal plane to actuate said tightening means, means to fasten overlapped parts of the strap together, and a handle to actuate said fastening means operable in a vertical plane transverse to the strap acted upon, substantially as described.

12. In a strap tightening appliance of the character described, the combination of a horizontal rack-bar disposed edgewise vertically, means secured to said bar to clamp a portion of the strap to be tightened, a member slidable on said rack-bar toward and from said clamping means, strap clamping means on said slidable member, a gear on said member in mesh with the teeth of said rack-bar, means to operate said gear, a pawl on said slidable member co-acting with the teeth of said rack-bar, an abutment plate secured to said rack-bar, a movable combined shear and clamp-bar, means to operate said clamp-bar to grip a portion of the strap between it and the abutment plate, means to lock overlapped parts of the tightened strap together, means co-operating with said shear and clamp bar to sever the used portion of the strap from the stock supply, and operating means for said locking and severing means common to both, substantially as described.

OTTO RABE.

[L. S.] THE NORTHERN TRUST COMPANY,
By WM. S. MILLER,
Vice President,
Executors of the estate of Samuel J. Turner, deceased.