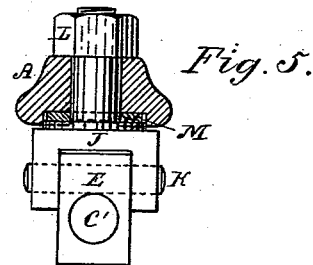
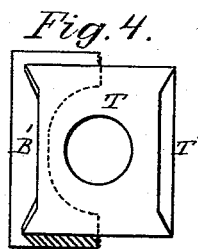
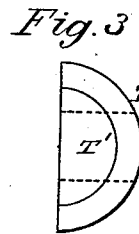
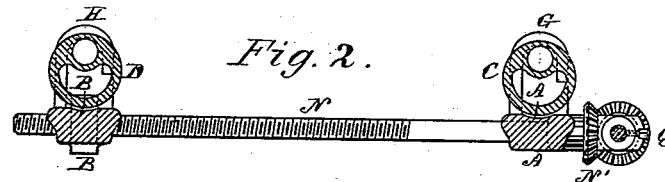
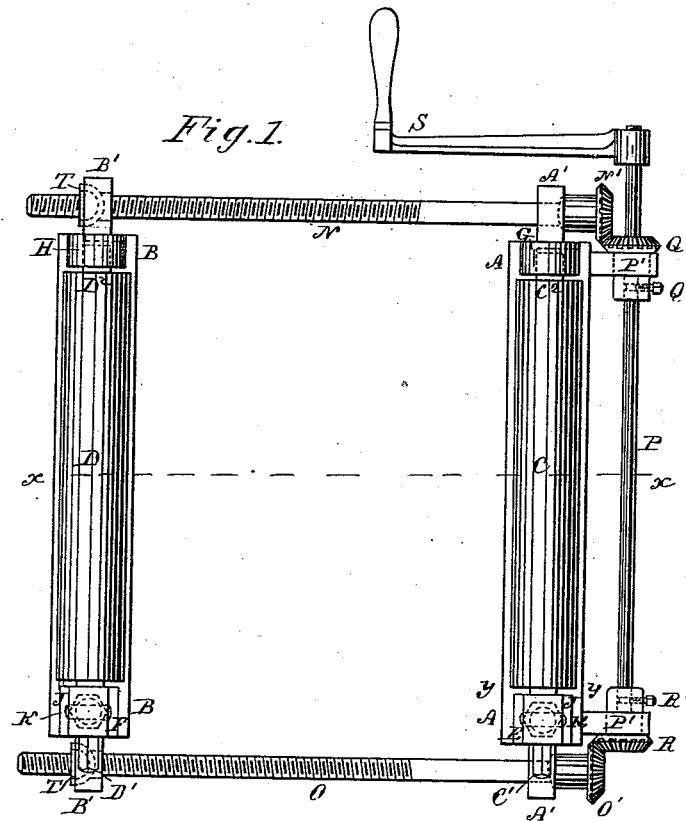


(No Model.)

F. N. GARDNER.  
BELT TIGHTENING MACHINE.

No. 262,760.

Patented Aug. 15, 1882.



Witnesses.

Edwin F. Dimock  
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Frederick N. Gardner  
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# UNITED STATES PATENT OFFICE.

FREDERICK N. GARDNER, OF HARTFORD, CONNECTICUT.

## BELT-TIGHTENING MACHINE.

SPECIFICATION forming part of Letters Patent No. 262,760, dated August 15, 1882.

Application filed July 14, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK N. GARDNER, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Belt-Tightening Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby a person skilled in the art can make and use the same, reference  
10 being had to the accompanying drawings, and to the letters of reference marked thereon.

Like letters in the figures indicate the same parts.

My improvement relates to a machine or device which can be attached to belts, particularly those which are long or heavy, for the purpose of drawing them tight over the pulleys and bringing the ends together, so that they can be laced at the proper degree of tension.  
20

The object of my invention is to provide a better and more efficient device than has heretofore been in use for this purpose.

In the accompanying drawings, illustrating my invention, Figure 1 shows a top view of my improved machine. Fig. 2 is a cross-section of the same, looking upward from the line *x x* of Fig. 1. Fig. 3 is a side or edge view of the oscillating nut upon the side screws. Fig. 4  
30 is a flat view of the nut and its socket, looking from the end of the screw. Fig. 5 is an end view of the locking-bar, looking down from the line *y y*, Fig. 1, showing the hinge upon which it opens.

A and B are two solid metallic bars, against which the belt is clipped. They are furnished with ears A' and B' at their ends, through which pass screws for drawing them together, as will be described.

C and D are eccentric rollers serving as cams to clip the belt between them and the bars A and B. They are furnished with journals at their ends, upon which they turn. The journals C' and D' pass through boxes E and F,  
45 which are hinged to the bars A and B, and terminate in squares, to which a wrench can be applied to turn the rollers C and D when desired. The journals C<sup>2</sup> and D<sup>2</sup> pass under hooks G and H, from which they can be un-

hooked when desired and turned upward for inserting the belt under the rollers. The hooks G and H are firmly attached to the bars A and B.

The construction of the hinge-connection between the bars A B and the rollers C D is shown more particularly in Fig. 5.

J is the socket part of the hinge, into which the box E fits and turns upon the pin K. The lower part of J forms a stem or bolt, which passes through the bar A, and is furnished  
60 on the under side with a nut, L, by which it can be drawn more or less downward against an elastic packing, M. This is for the purpose of regulating the distance between the roller C and the bar A at one end, so that the roller  
65 can be adjusted to clip a belt of different thickness at the two edges.

N and O are two screws turning freely in collars at A' and passing through swivel-nuts of a novel construction at B'.  
70

P is a rod reaching across the machine from side to side, and turning in bearings in lugs P', extending out from the bar A. It is furnished with the two bevel-gear wheels Q and R, which gear into bevel-wheels N' O', fixed to the  
75 screws N and O. It is also furnished with a crank-handle, S, for turning it in the customary manner.

Q' and R' are set-screws by which the wheels Q and R are held to the rod P, so as to revolve  
80 with it. If either of them is loosened, the revolution of the rod P will only turn the other screw and leave the one connected with the loose gear stationary. This is for the purpose of drawing up one side of a belt more than  
85 the other when required, or to bring the machine to an even draft if it does not clip the belt properly.

T T are swivel-nuts, of a peculiar and novel construction, fitting upon the screws N O and  
90 resting in sockets in the ears B' of the bar B. These nuts are shown more particularly in Figs. 3 and 4. Each nut consists of a half-cylinder having dishing ends, which gives the nut one flat side and one curved side in the  
95 direction of the hole through which the screw passes. This curved surface, resting in the socket in B', allows the nut to swing to either

side, so as not to bind the screw when the bar B is not parallel with the bar A. This allows one edge of the belt to be drawn together without the other. The ends T' of the nut are  
 5 formed with a flat central part and a raised rim, which extends around the curved bearing-surface before described, being, in fact, half of the dish in the end of the original cylinder, from which the nut is supposed to be formed.  
 10 This raised rim fits into a corresponding inward incline in the socket, and forms a dovetail within it, so that the nut cannot be pushed directly outward by the screw. The nut can only be inserted or removed from the socket  
 15 by slipping it in endwise with the hole in a direction at right angles to the screw. As it passes in it turns round the curve to its proper position, and then the screw is inserted. It then cannot be removed or forced out while  
 20 the screw is in the thread. This arrangement enables the two screws to push the bars A and B apart by the nuts, as well as to draw them together.

The operation of my invention is as follows:  
 25 When it is desired to tighten a belt, so as to lace it or to cut out a piece for relacing, the rollers are turned with their greatest projection away from the bars A B, and can then be readily unhooked and turned upward. The belt  
 30 is then inserted under them, when they are rehooked and turned by means of the squares C' D' to clip the belt. The handle S is then revolved, which turns the screws so as to draw the bars A and B together. The action of the  
 35 belt draws the cam-rollers tighter, and the belt cannot slip unless one edge is thicker than the other. In this case the opening between the roller and the bar is adjusted by the nut L, so that the belt is evenly held. If it should

happen that one side of the belt needs to be  
 40 drawn or tightened more than the other, the set-screw Q' or R' on the opposite side is loosened and one screw turned until the proper tension is obtained, when it is again screwed up so as to move both screws, N and O. When  
 45 the belt is drawn together and sufficiently tightened, it can be easily laced, after which the screws are relaxed and the machine removed.

What I claim as my invention is—

1. In a belt-tightening machine, the combination of the cam-roller C with the bar A, said roller being hinged at one end and provided with a detachable fastening at the other, substantially as described. 50

2. In a belt-tightening machine constructed substantially as shown, the square C' upon the end of the journal of the cam-roller C, substantially as described. 55

3. In a belt-tightening machine, the adjusting device J L between the bar A and the roller C, in combination with said bar and roller, substantially as described. 60

4. The dovetailed swivel-nut T, in combination with its dovetailed socket in the part B', and the screw N, substantially as described. 65

5. The combination of the screws N O, provided with swivel-nuts resting in the bar B, and with bearings in the bar A, the bevel-gear wheels N' O', the rod P, and the bevel-gear wheels Q R, provided with the set-screws Q' R', whereby either screw N or O can be turned without the other, substantially as described. 70

FREDERICK N. GARDNER.

Witnesses:

THEO. G. ELLIS,  
 EDWIN F. DIMOCK.