

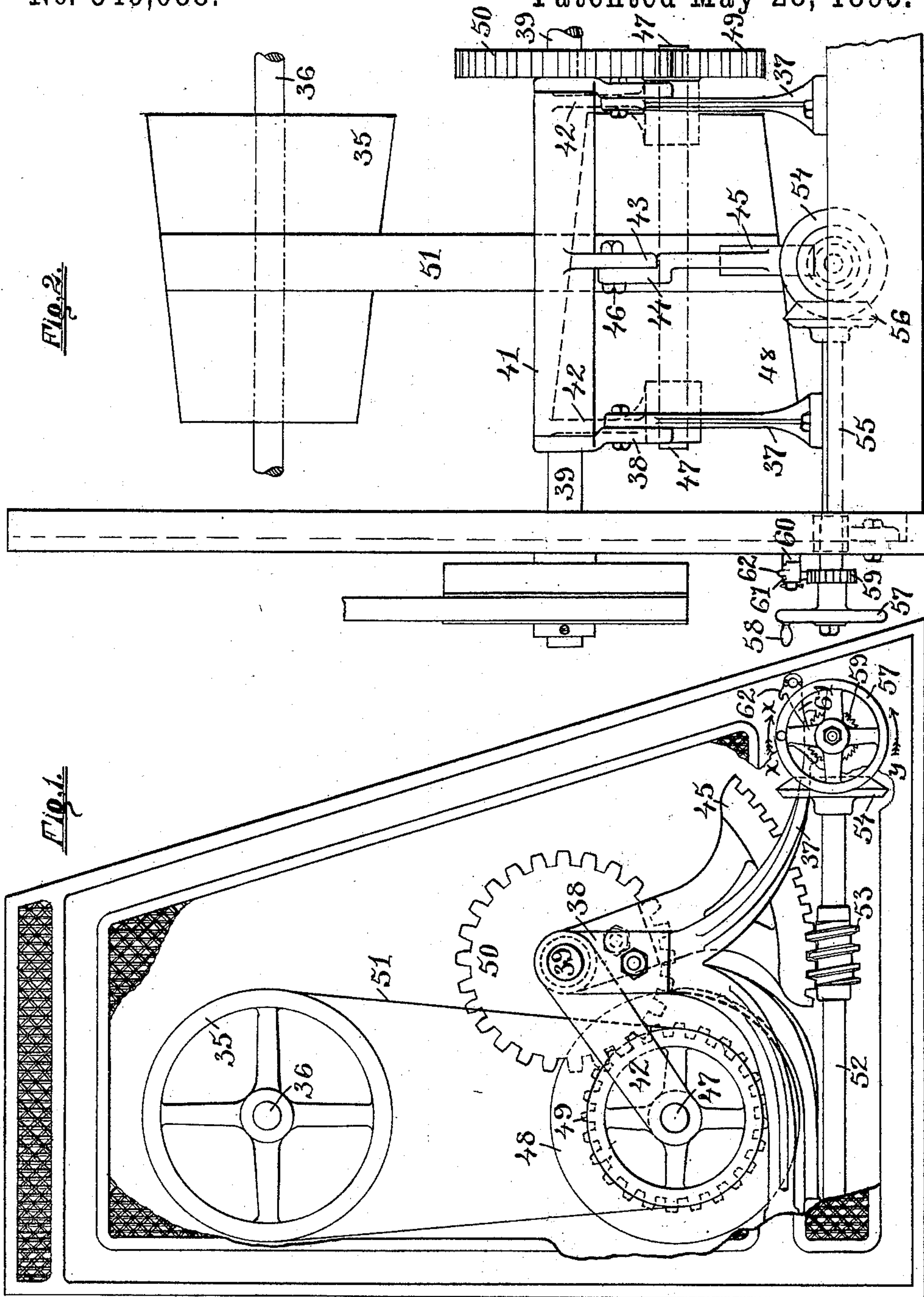
(No Model.)

2 Sheets—Sheet 1.

A. D. CHANDLER.  
BELT TIGHTENER.

No. 540,088.

Patented May 28, 1895.



WITNESSES

Henry J. Miller

Chas. H. Luther Jr.

INVENTOR

Alfred D. Chandler,  
by Joseph Miller & Co.,  
Atty.

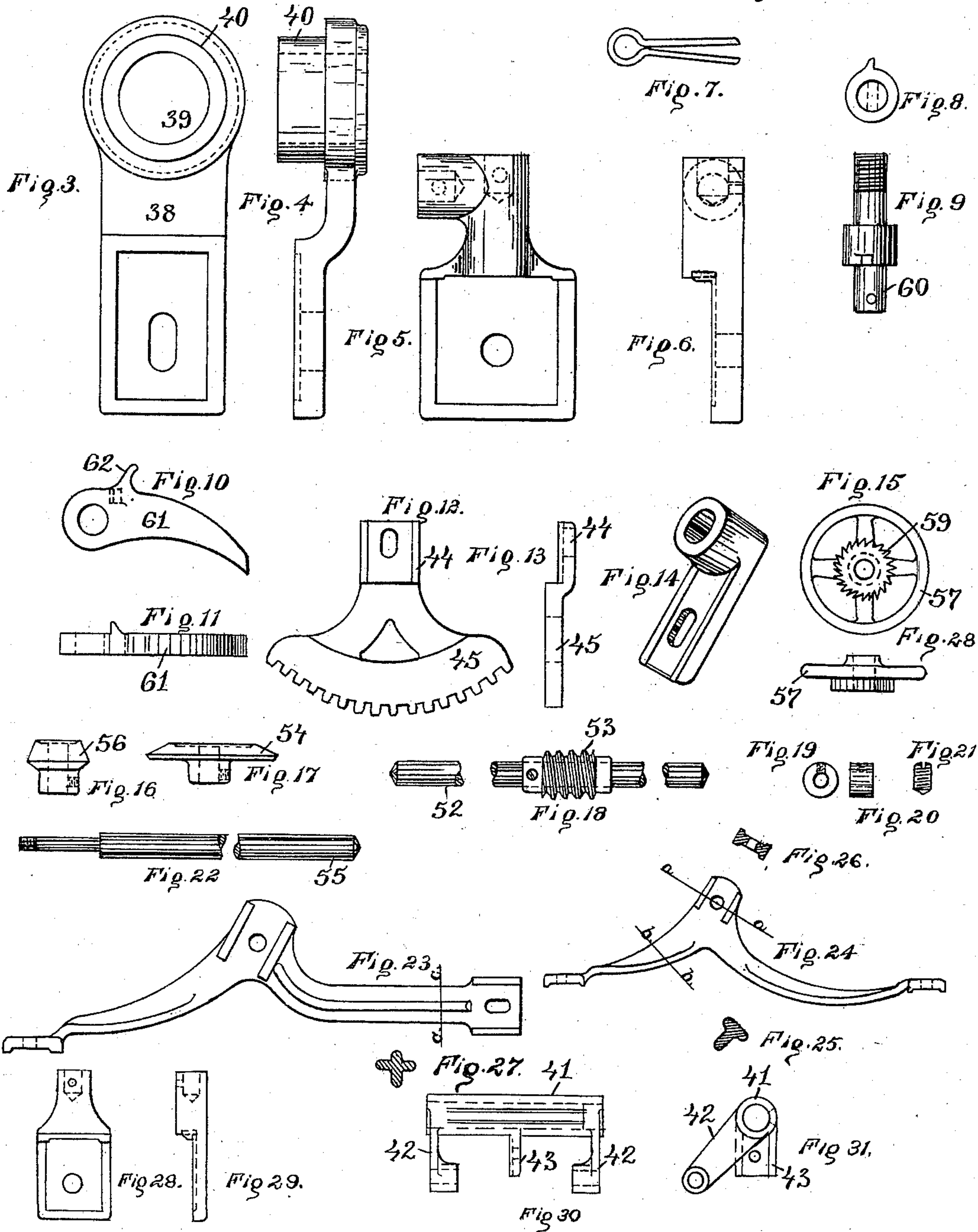
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WITNESSES

Kenneth J. Miller

Chas. H. Luther

INVENTOR

Alfred D. Chandler,  
by Joseph H. Miller & Co.,  
Attys.



# UNITED STATES PATENT OFFICE.

ALFRED D. CHANDLER, OF FALL RIVER, MASSACHUSETTS.

## BELT-TIGHTENER.

SPECIFICATION forming part of Letters Patent No. 540,088, dated May 28, 1895.

Application filed December 18, 1893. Serial No. 493,889. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED D. CHANDLER, of Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Belt-Tighteners; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to improvements in devices for tightening driving-belts. It is herein shown as applied to a railway head but may be arranged for the tightening of other belts.

The object of the invention is to so construct a belt-tightener, of the nature herein described, that it may be positively operated to loosen or tighten the belt to which it is applied.

Another object of the invention is to so construct a belt-tightener, adapted for use in a machine having an inclosing casing, that the belt-tightener may be operated from the outside of said casing and secured in any desired position.

The invention consists in the combination with a fixed cone or other pulley, of the movable pulley, the continuous belt extending over both pulleys, and the mechanism for supporting the loose pulley and for adjusting its location concentrically.

The invention also consists in the sleeve having arms between the ends of which the loose pulley is journaled, the segmental-gear extending from the sleeve, the worm-gear meshing with the segmental-gear, together with the worm-gear shaft and the mechanism for operating the worm-gear shaft and for locking the same against backward rotation.

The invention also consists in such other peculiar features of construction and combination of parts as may hereinafter be more fully described and pointed out in the claims.

Figure 1 represents an end elevation of a railway-head or similar machine partially broken away and showing my improved belt-tightening device applied thereto. Fig. 2 represents a rear elevation of parts of the same to more clearly illustrate the application of the device. Fig. 3 represents a front elevation of one of the bracket-arms on which the

loose pulley-sleeve is journaled, Fig. 4 being a side view of the same. Figs. 5 and 6 are similar views of the bracket in which the adjoining ends of the worm-gear shaft and the adjusting-shaft are journaled. Fig. 7 is a view of the pawl-pin, Figs. 8 and 9 being end and plan views of the pawl-shaft. Figs. 10 and 11 are side and plan views of the pawl. Figs. 12 and 13 are face and edge views of the segmental gear. Fig. 14 is a view, partially in perspective, of the sleeve in which the outer or casing portion of the adjusting-shaft is journaled. Fig. 15 is a view of the hand-wheel and its ratchet. Fig. 16 represents a view of the bevel-gear on the adjusting-shaft. Fig. 17 is a view of the gear on the worm-gear shaft, Fig. 18 representing a view of the worm-gear shaft partially broken away. Figs. 19 and 20 are views of the collar on the adjusting-shaft, and Fig. 21 is an enlarged view of the set-screw therefor. Fig. 22 is a view of the adjusting-shaft partially broken away. Figs. 23 and 24 represent elevations of the spreaders to which the bracket-arms represented in Figs. 3 and 4 are secured. Fig. 25 is a cross-sectional view taken on a line *a a*, Fig. 24, Fig. 26 being a similar view taken on a line *b b*, same figure. Fig. 27 is a similar view taken on a line *c c*, Fig. 23. Figs. 28 and 29 represent views of the plate and its bearing in which the frame end of the worm-gear shaft is journaled. Fig. 30 represents an elevation of the sleeve and its arms between which the loose pulley is journaled, and Fig. 31 is an end view thereof more clearly showing the locations of the arms with reference to the plate to which the segmental gear is attached.

Similar numbers of reference designate corresponding parts throughout.

In carrying my invention into practice I mount the pulley 35 on a shaft 36 which is journaled in bearings in the upper part of a suitable frame-work. At the lower portion of the machine I secure the spreaders 37—37 and to the upper portion of the spreaders I removably secure the bracket-arms 38—38 having perforations at their upper ends through which the drive-shaft 39 may extend and bearing-collars 40—40, the construction of these arms being more clearly shown in Figs. 3 and 4.

Journaled on the collars 40—40 of the arms 38 and inclosing the drive-shaft is the sleeve



41 having forwardly inclined arms 42—42 having bearings at their outer ends, and a rearwardly-inclined plate 43 to which the arm 44 of the segmental-gear 45 is adjustably secured 5 by the bolt 46. The shaft 47 is journaled in the bearings of the arms 42—42, and mounted on this shaft is the pulley 48, which, if a cone-pulley is used, is set with its base opposite the smaller end of the fixed pulley 35. On this 10 shaft 47 is also secured a gear 49 which intermeshes with and is driven by the gear 50 on the drive-shaft. It is, therefore, evident that if the outer ends of the arms 42—42, carrying the pulley 48, are moved upward or downward, 15 this movement will be concentric with the drive-shaft 39 and the gears 49 and 50 will always remain in their positions relative to each other. On the pulleys 35 and 48 I place the continuous belt 51 by means of which movement is conveyed from the pulley 48 to drive 20 the pulley 35.

In the lower portion of the casing the worm-gear shaft 52 is journaled below the segmental gear and in the vertical plane thereof. On 25 this shaft is rigidly secured the worm 53 which intermeshes with the segmental gear 45, and on the end of the shaft is keyed the bevel-gear 54. The adjusting-shaft 55 is journaled in the lower portion of the casing and extends 30 through one side of the same. Extending in a direction at right angles with the shaft 52, on the inner end of this adjusting-shaft, is secured the bevel-gear 56 which intermeshes with the gear 54 on the shaft 52, while at the 35 outer end of the adjusting-shaft is secured the hand-wheel 57 having the handle 58 and a sleeve on which the ratchet 59 is secured.

Secured in the side of the casing above the adjusting-shaft is the pawl-shaft 60 on which 40 the pawl 61 having the thumb-piece 62 is pivoted, being located just above the ratchet 59 with which the free end of the pawl is adapted to engage.

When the belt 51 is first placed on the pulleys, the pulley 48 should be elevated or 45 brought nearer the fixed-pulley 35. This is accomplished by throwing back the pawl from engagement with the ratchet 59 and turning the hand-wheel 57 in the direction indicated 50 by the arrow  $x-x$  in Fig. 1, this movement of the hand-wheel being transmitted through the gears 56 and 54 to the worm-gear 53 which acts on the segmental gear to move this gear forward, the sleeve 41 being thus rotated in a 55 direction to swing the arms 42, between which the pulley 48 is journaled, upward concentrically with the shaft 39 so that the pulley 48 is brought near to the fixed pulley 35 while the gear 49 is continually engaged with the 60 gear 50. The belt being adjusted on the pulleys 35 and 48, the pawl 61 is swung back to engage the teeth of the ratchet 59 and the hand-wheel 57 is turned in the direction indicated by the arrow  $y$ , in Fig. 1, the result being 65 to advance the segmental-gear 45 toward the back of the case and lowering the arms 42 of the sleeve 41 to separate the pulleys

and bring a strain on the belt. From time to time as the belt stretches a further movement 70 of the hand-wheel is made in this last direction to take up the slack in the belt, and when turned the hand-wheel is held against backward rotation by means of the pawl 61 engaging the ratchet 59. This adjustment to tighten 75 the belt can be operated while the machine is running without affecting the product thus saving time of stopping to take up belts and reducing product as with any other known device.

Having thus described my invention, I 80 claim as new and desire to secure by Letters Patent—

1. In a belt-tightener, the combination with a drive-shaft journaled in bearings, and a gear mounted on said shaft, of bearing col- 85 lars surrounding this shaft and supported independently thereof, a sleeve, surrounding said shaft and rotatable on these bearings having laterally-extending arms, and a central securing-plate extending from the sleeve 90 at an angle from said arms, a pulley rotatably supported on a shaft between said arms, a gear secured to said shaft and intermeshing with the gear of the drive-shaft, a segmental-gear mounted on said securing-plate, and 95 means for moving said segmental-gear, as described.

2. In a belt-tightener, the combination with a casing, a shaft provided with a worm journaled in the lower portion of the casing, a 100 bevel-gear keyed to said shaft, an adjusting-shaft journaled at right angles with the first mentioned shaft and extending through the side of the casing, a bevel-gear on the inner end of the adjusting-shaft intermeshing with 105 the corresponding gear of the worm-shaft, and a hand wheel at the outer end of the adjusting-shaft, of a drive-shaft journaled in bearings transversely to the worm-shaft, a gear on said shaft, bearing collars surround- 110 ing the drive-shaft, brackets for supporting these bearings, a sleeve, having lateral arms and a central laterally-extending securing-plate, journaled on said bearing collars, a pulley journaled between the arms and provided 115 with a gear intermeshing with the gear of the drive-shaft, a segmental-gear adjustably fastened to the securing-arm and engaged by the worm, a pulley rotatably mounted at the upper portion of the casing, and a continuous 120 belt passing over both pulleys.

3. The combination with the shaft 52 journaled in bearings and provided with the worm 53 and the gear 54, the shaft 55, journaled at right angles with the shaft 52, provided with 125 the gear 56 engaging with the gear 54, and the hand-wheel 57 having the ratchet 59, and the pawl 61 pivoted above the ratchet and engagable therewith, of the drive-shaft 39 journaled in bearings transversely to the 130 worm-shaft, the gear 50 keyed to this shaft, the brackets or spreaders 37, the bracket-arm 38 secured to said brackets and having bearing-collars 40 surrounding the drive-shaft,



the sleeve 41 journaled on the bearing-collars and having the arms 42—42 and plate 43, the shaft 47 journaled in bearings at the ends of the arms 42, the pulley 48 mounted on this shaft, the gear 49 also on this shaft and intermeshing with the drive-gear, and the segmental-gear 45 secured to the plate 43 and intermeshing with the worm 53.

4. In a belt-tightener, the combination with a rotatable pulley mounted on a fixed shaft, of a drive-shaft, a gear on said shaft, bearings movable concentric with the drive-shaft, a shaft journaled in said bearings, a pulley mounted on this shaft, a gear also on said shaft engaged by the gear of the drive-shaft, and means for moving the bearings to bring the pulleys nearer together or to separate them, as and for the purpose described.

5. In a belt-tightener, the combination with a shaft journaled in fixed bearings, and a belt-pulley mounted on the shaft, a shaft, movable bearings in which the shaft is journaled, a belt-pulley on this last mentioned shaft, mechanism for moving these bearings, and the shaft journaled therein, and a belt connecting the two pulleys, of a drive-shaft,

and means located between the same, and the movable shaft for transmitting the motion of the drive-shaft to the movable shaft, as described.

6. In a belt-tightener, the combination with a drive-shaft journaled in bearings, a gear on said shaft, bearing-collars embracing said shaft, standards on which these bearing-collars are supported independent of the drive-shaft, a sleeve also embracing the drive-shaft and journaled on the bearing-collars, said sleeve being furnished with lateral arms, a shaft journaled in the outer ends of said arms, a belt-pulley mounted on this shaft, a gear on said shaft intermeshing with the gear of the drive-shaft, and mechanism for rotating the sleeve to adjust the location of the belt-pulley, of a shaft journaled in fixed bearings, a belt-pulley mounted on this shaft, and a belt connecting the two belt-pulleys.

In witness whereof I have hereunto set my hand.

ALFRED D. CHANDLER.

Witnesses:

HENRY J. MILLER,  
M. F. BLIGH.