

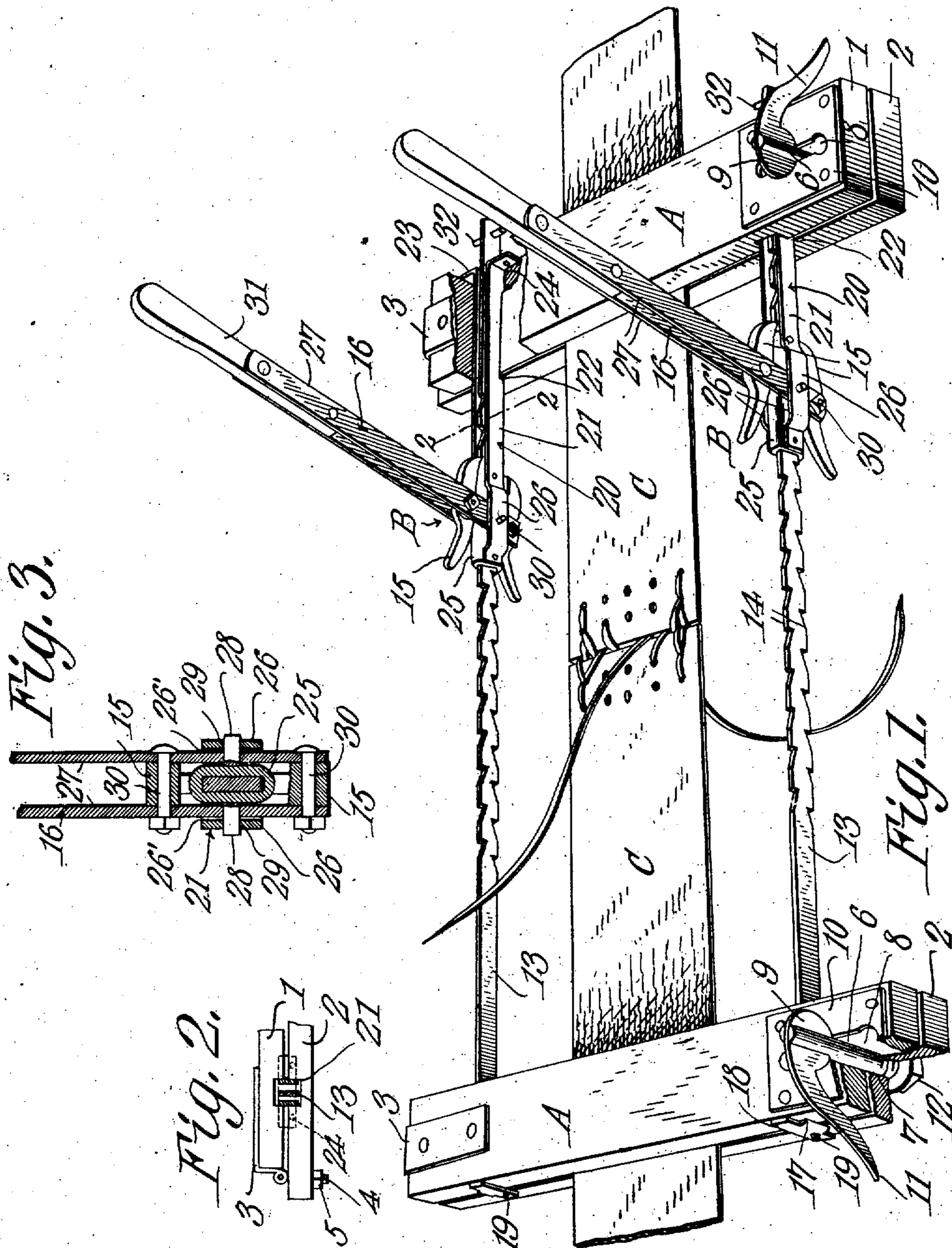
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W. A. CHRISTENSEN.

BELT TIGHTENER.

APPLICATION FILED NOV. 9, 1906.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM A. CHRISTENSEN, OF BARRON, WISCONSIN.

BELT-TIGHTENER.

No. 850,135.

Specification of Letters Patent.

Patented April 16, 1907.

Application filed November 9, 1906. Serial No. 342,638.

To all whom it may concern:

Be it known that I, WILLIAM A. CHRISTENSEN, a citizen of the United States, residing at Barron, in the county of Barron and State of Wisconsin, have invented a new and useful Belt-Tightener, of which the following is a specification.

The present invention relates to a belt-tightener for drawing the ends of the belt together for the purpose of lacing them; and it relates more particularly to a tightener of that type having a pair of jaws adapted to be adjusted to the ends of the belt and a ratchet mechanism for drawing the jaws toward each other.

The invention has for one of its objects to improve and simplify the construction and operation of apparatus of this character, so as to be comparatively inexpensive to manufacture, easy and efficient in use, and capable of producing a powerful draft.

A further object of the invention is to provide an improved form of jaw which can be quickly and readily adjusted to belts of different dimensions and firmly clamped thereto.

The invention has as a further object to improve the rack-bar and ratchet device connected with the jaws, so as to work smoothly and enable a powerful draft to be produced with an expenditure of comparatively little power on the part of the operator.

With these objects in view and others, as will appear as the nature of the invention is better understood, the invention comprises the various novel features of construction and arrangement of parts, which will be fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one of the embodiments of the invention, Figure 1 is a perspective view of the belt tightener or stretcher with portions broken away to better illustrate certain of the details. Fig. 2 is a detail sectional view on the lines 2-2, Fig. 1, showing one end of one of the jaws in elevation. Fig. 3 is a transverse section of one of the rack-bars and adjacent parts of the ratchet mechanism.

Corresponding parts in the several figures are indicated throughout by similar characters of reference.

Referring to the drawings, A designates the jaws, B the ratchet mechanisms connected with the jaws, and C the belt being stretched by the device for the purpose of lacing.

Each clamping-jaw A comprises a pair of plates 1 and 2, which are preferably strips of wood of suitable dimensions and hingedly connected at their rear ends by means of the bolt-hinge 3. The rear end of the bottom plate or member 2 projects slightly beyond the adjacent end of the top member 1, and the bolt 4 of the hinge passes through the projecting portion of the member 2. By means of a hinge of this character the jaw members can be adjusted nearer together or farther apart, according to the thickness of the belt to be clamped between them. Obviously, to effect this adjustment the nut 5 on the bolt of the hinge is turned in one direction or the other.

At the front ends of the jaw members a suitable clamping device is provided. This device comprises a bolt 6, which extends through a vertical opening 7 in the bottom plate 2 and through a longitudinal slot 8 in the top plate 1, as shown at the broken-away portion of the left-hand jaw, Fig. 1. The upper end of the bolt projects above the top member 1 and is longitudinally slotted to receive the pivotally-mounted cam 9. On the top surface of the member 1 is a wearing-plate 10, on which the cam bears. Preferably formed integral with the cam is a handle or lever 11, whereby the cam is adjusted for the purpose of clamping the jaws together or loosening them. On the lower end of the bolt 6 is a nut 12, by the adjustment of which the cam will clamp the jaw members to the belt, no matter what the thickness of the latter may be. The nuts of the hinges and those of the clamping devices will be so adjusted that the jaw members will produce a uniform grip throughout the area of contact with the belt. The cam 9 of each clamping device may be permanently pivoted to its bolt, and the longitudinal slot 8 permits of the top jaw member 1 being swung open or closed over the cam and its lever without interference when the cam has first been adjusted, so that it will be disposed lengthwise with the slot 8 and with the lever 11 extending upwardly in the path of the slot. By this construction it will be seen that the jaws can be readily set for belts of different thicknesses and can be quickly attached or detached to the belt.

Each ratchet mechanism is composed of a rack-bar 13, having staggered teeth 14 on its top and bottom edges, with which engage the coacting pawls 15, pivotally mounted on

the operating-lever 16. The rack-bar 13 is attached at one end to the left-hand jaw and is rigidly secured to the bottom member 2 thereof. On the opposed faces of the jaw members are transversely-extending slots 17, arranged slightly inward from the clamping device and hinge of the joint. These slots are provided so as to receive the ends of the rack-bars. The extremity of each bar is formed into a head 18, that is bent at right angles to the bar and engages the outer side faces of the left-hand jaw members. This head is apertured to receive the screw 19, whereby the rack-bar is fastened to the lower jaw member 2. By means of these heads the rack-bars are prevented from drawing out of the clamping-jaws. Each operating-lever 16 is fulcrumed on a supporting-frame 20, that comprises a pair of spaced parallel strips 21, disposed on opposite sides of the adjacent rack-bar 13 and accommodated in slots 22 on the opposed faces of the right-hand jaw members, Fig. 1. The outer ends of the strips 20 are bent laterally to form ears 23, that are disposed in contact with the outer sides of the jaw members 1 and 2. These strips are secured to the lower jaw member by screws or other fastening devices, one screw being shown at 24 at the broken-away portions of the jaw members. Between the inner ends of the strips 21 of the lever-supporting frame is a tubular guide 25, through which the adjacent rack-bar is extended. This tubular guide is of comparatively short length, and the pawls 15, which are disposed above and under the same, project over the end of the guide nearest the right-hand jaw so as to engage with the ratchet-teeth. The guide 25 is suitably secured to the strips 21, and the latter are each offset at 26 so as to form spaces 26' on opposite sides of the guide for the reception of the two plates 27 of the operating-lever.

As shown more clearly in Fig. 3, trunnions 28 extend from opposite sides of the guide 25 to form the fulcrums for the plates 27 of the operating-lever. These trunnions or journals also pass through openings 29 in the offset portions 26 of the strips 21. The dogs 15 are disposed between the lower ends of the plates 27 to form spacers for the latter, and they are pivoted on bolts 30. Secured to the upper ends of the plates 27 is a handle 31, which is gripped by the operator when the lever is to be oscillated. The rack-bars 13 extend at their right-hand extremities beyond the lever-supporting frames 20 and are provided with stops 32, which are adapted to engage the ears 23 of the said frame so as to hold the two jaws together at all times by preventing the rack-bars from pulling out of the right-hand jaw.

From the foregoing description, taken in connection with the accompanying drawings,

the advantages of the construction and of the method of operation will be readily understood.

In operation the jaws of the belt-fastener are adjusted each to an end of the belt to be laced. To do this, each jaw is opened by swinging the members thereof apart, so that the belt can be received between them. The jaw members are then brought together and the cam 9 thereof swung around on the bolt 6 as an axis, so as to be at right angles to the slot 8. The nuts 5 of the hinges 3 and nuts 12 of the clamping devices are adjusted according to the thickness of the belt. The cam 9 of each jaw is then turned on its pivot, so that the jaw members will be tightly clamped on the belt. The operating-levers 16 are next actuated back and forth by the operator, so as to draw the jaws toward each other by means of the coacting dogs 15, engaging with the successive teeth of the rack-bars 13, thereby producing a relative step-by-step movement of the jaws A. The operation of the levers is continued until the ends of the belt meet. The device holds the parts of the belt in this position while the ends thereof are laced. After the lacing is finished the device is removed by first swinging the cams 9 on their pivots, so that the levers will be disposed vertically and then swinging them through ninety degrees on the bolt 6, so as to be lengthwise with the slots 8. After this has been done the top members 1 of the jaws are swung open one after the other and the device taken off the laced belt.

I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof; but I desire to have it understood that the apparatus shown is merely illustrative and that various changes may be made, when desired, as are within the scope of the invention.

What is claimed is—

1. In an apparatus of the class described, a clamping-jaw comprising a pair of members, an adjustable hinge connection between the members at one end, said connection being composed of two pintle-connected parts one fixedly secured to one jaw member and the other adjustably secured to the opposite jaw member, and an adjustably-mounted cam at the opposite end of the jaw from the connection which coöperates with the latter for gripping belts of different thicknesses.
2. In an apparatus of the class described, a clamping-jaw comprising a pair of members of which one is slotted, an adjustable hinge connection between the members at one end, a device extending through the slot of the slotted member and turnably mounted in the other member, a cam on the device mounted for pivotal movement and adapted to be adjusted in alinement with the slot for permitting the jaw members to open and close.

3. In a device of the class described, the combination of a pair of gripping devices, a rack-bar secured to one of the same, a frame secured to the other device comprising a pair
5 of spaced strips between which the rack-bar moves, a tubular guide secured between the strips, an operating-lever fulcrumed on the guide, and pawls mounted on the lever.

4. In a device of the class described, the
10 combination of a pair of gripping devices, a rack-bar secured to one of the same, a frame secured to the other device comprising a pair of spaced strips between which the rack-bar moves and having oppositely-disposed offset
15 portions, a tubular guide secured between the strips at the offset portions thereof, an operating-lever having a pair of members extending into the space between the guide and offset portions, fulcrums on the guides for
20 the said members, and pawls mounted on the lever.

5. In a device of the class described, the combination of a gripping device comprising a pair of members having slots in their op-

posed faces, a pair of spaced strips extending 25 through the slots and having laterally-turned ends engaging the sides of the members, a rack-bar movable between the strips, a guide for the rack-bar, means for connecting the guide with the said strips, an operat- 30 ing-lever fulcrumed on the guide, and pawls mounted on the lever.

6. In a device of the class described, the combination of a gripping device comprising a pair of parallel members having slots in 35 their opposed faces, a rack-bar movable through the slots, a stop on the end of the rack-bar, an operating-lever, a frame on the gripping device, means for fulcruming the lever on the frame, and a pair of dogs on the 40 lever.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM A. CHRISTENSEN.

Witnesses:

MAUD B. BURTON,
F. B. KINSLEY.