

H. D. COLMAN.
WARP CARRIAGE.

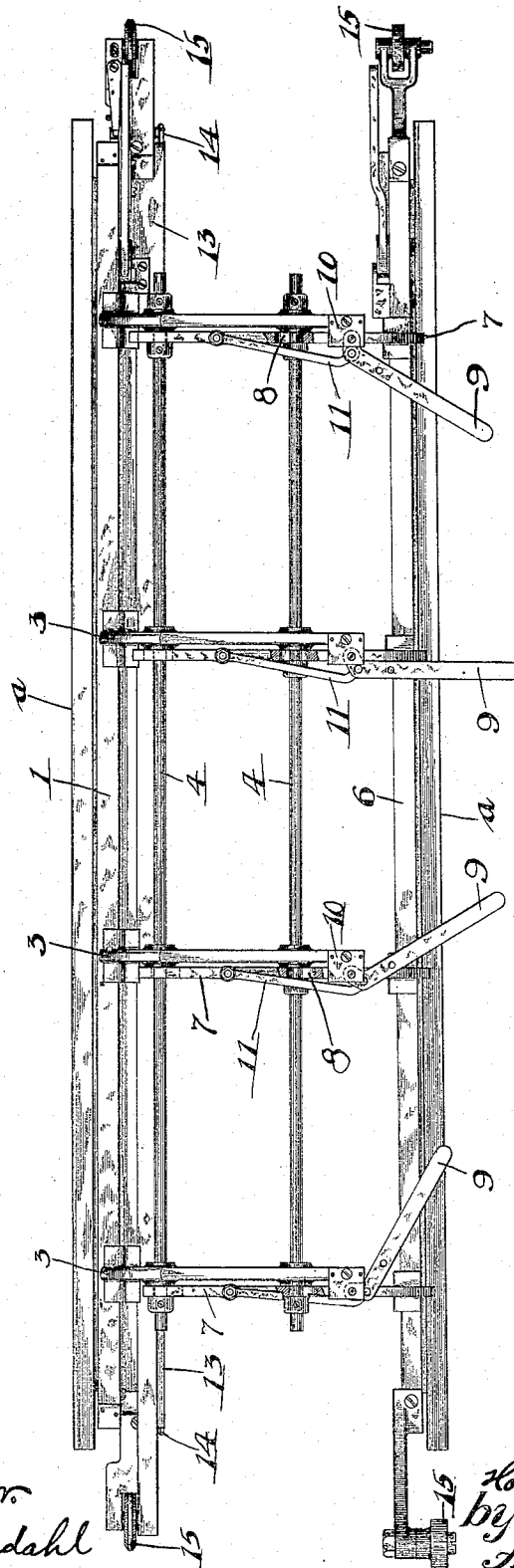
APPLICATION FILED OCT. 28, 1907.

942,247.

Patented Dec. 7, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



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Fig. 2.

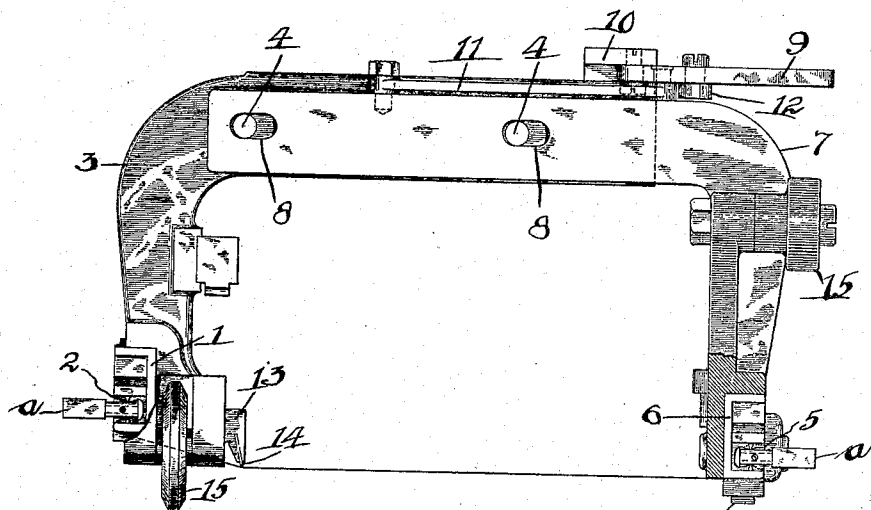
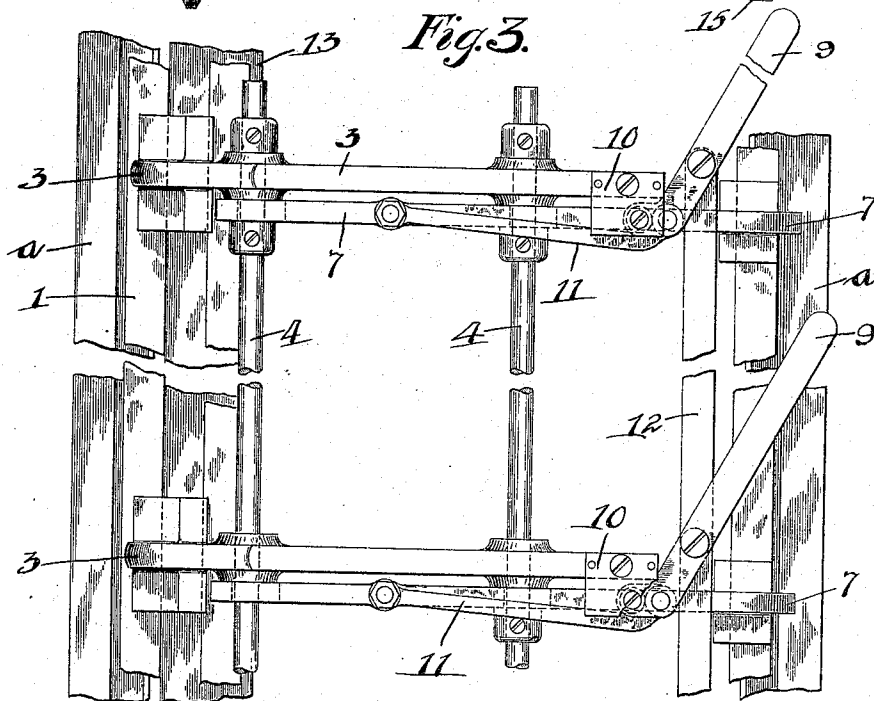


Fig. 3.



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UNITED STATES PATENT OFFICE.

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WARP-CARRIAGE.

942,247.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed October 28, 1907. Serial No. 399,437.

To all whom it may concern:

Be it known that I, HOWARD D. COLMAN, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Warp-Carriages, of which the following is a specification.

This invention relates to improvements in the warp-carriages of automatic warp-tying machines and other warp-handling machines.

In the accompanying drawings Figure 1 is a top plan view of a warp carriage embodying the features of my invention. Fig. 2 is an end elevation of a warp carriage of slightly different construction. Fig. 3 is a fragmental top plan view of the form of carriage shown in Fig. 2.

The warp carriage herein shown is intended to support a section of warp in a warp-tying machine, being provided for this purpose with two clamps extending longitudinally of the carriage at opposite sides thereof. In order that tension may be placed upon the threads of the warp, said clamps are arranged to be bodily moved in a straight line toward and away from one another.

The present invention relates to a construction permitting of such a movement of the warp clamps.

As indicated in Fig. 2, the framework of the carriage, in its present embodiment, is of inverted U-shape, and consists of two substantially similar sections movable toward and away from each other. A channel bar 1 constitutes the frame of the warp clamp 2. To said channel bar are rigidly secured angular arms 3, through the horizontal portions of which arms extend two rods 4 rigidly securing said arms together. The frame of the warp clamp 5 at the opposite side of the carriage consists of a channel bar 6. A plurality of angular arms 7 is fixed to the channel bar 6, each being provided in its horizontal portion with elongated openings 8 through which the rods 4 extend.

The clamps 2 and 5 are moved toward and away from each other by means comprising, in this instance, a plurality of hand levers 9, each pivotally mounted upon a bracket 10 fixed to the angular arms 3, and a link 11 connecting each of said hand levers with one of the angular arms 7. It will be seen that

a pivotal movement of the hand levers 9 will cause a movement of the arms 3 and 7 with relation to each other and consequently a relative movement between the clamps 2 and 5 fixed to said arms. The hand levers 9 are arranged to throw slightly "over centers" in order to lock the clamps 2 and 5 in their separated or tension-applying position.

The hand levers 9 may be made independently operable, as shown in Fig. 1, or they may be connected together for simultaneous and equal movement by means of a rod 12 pivotally connected to all of said levers, as shown in Figs. 2 and 3. It will, therefore, be seen that the warp threads may be simultaneously or successively placed under tension, as may be desired.

The clamps 2 and 5 may be of any suitable construction. The construction of said clamps and their operating devices, therefore, has not been illustrated in detail herein.

The warp threads may be placed in the clamps 2 and 5 by means of the insertion bars *a*.

Rigidly secured to the channel bar 1 and the arms 3 is a bar 13 in which is slidably mounted a serrated metallic deflecting ribbon 14 across which the warp threads pass.

The carriage is supported in the warp-tying machine by any suitable means, as the rollers 15.

In use, the threads are inserted in the clamps 2 and 5 and said clamps closed to hold said threads firmly therein. The hand levers 9 are then swung toward the right (Fig. 1) to separate the clamps, thereby placing tension upon the threads secured in said clamps.

I am aware that various changes may be made in the embodiment herein shown of my invention without departing from the spirit and scope of said invention, wherefore I desire not to limit myself to the precise details herein set forth.

I claim as my invention:

1. In a warp carriage, in combination, a framework carrying a warp clamp; arms slidably mounted in said frame; a clamp carried by said arms; hand levers mounted in said frame; and a link connecting each of said hand levers with one of said arms.

2. In a warp carriage, in combination, a framework; a clamp carried by said framework; a plurality of arms slidably mounted

in said framework; a clamp carried by said arms; hand levers mounted in said framework; a rod connecting all of said hand levers for simultaneous movement; and a
5 link connecting each of said hand levers with one of said arms.

3. In a warp carriage, in combination, a plurality of angular arms each comprising a horizontal portion; two longitudinal rods
10 secured in the horizontal portions of said arms; a warp clamp carried by said arms;

a plurality of angular arms, each comprising a horizontal portion having two elongated openings therein through which said rods extend; a warp clamp secured to said last
15 mentioned arms; and means for moving said sets of arms toward and away from each other.

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