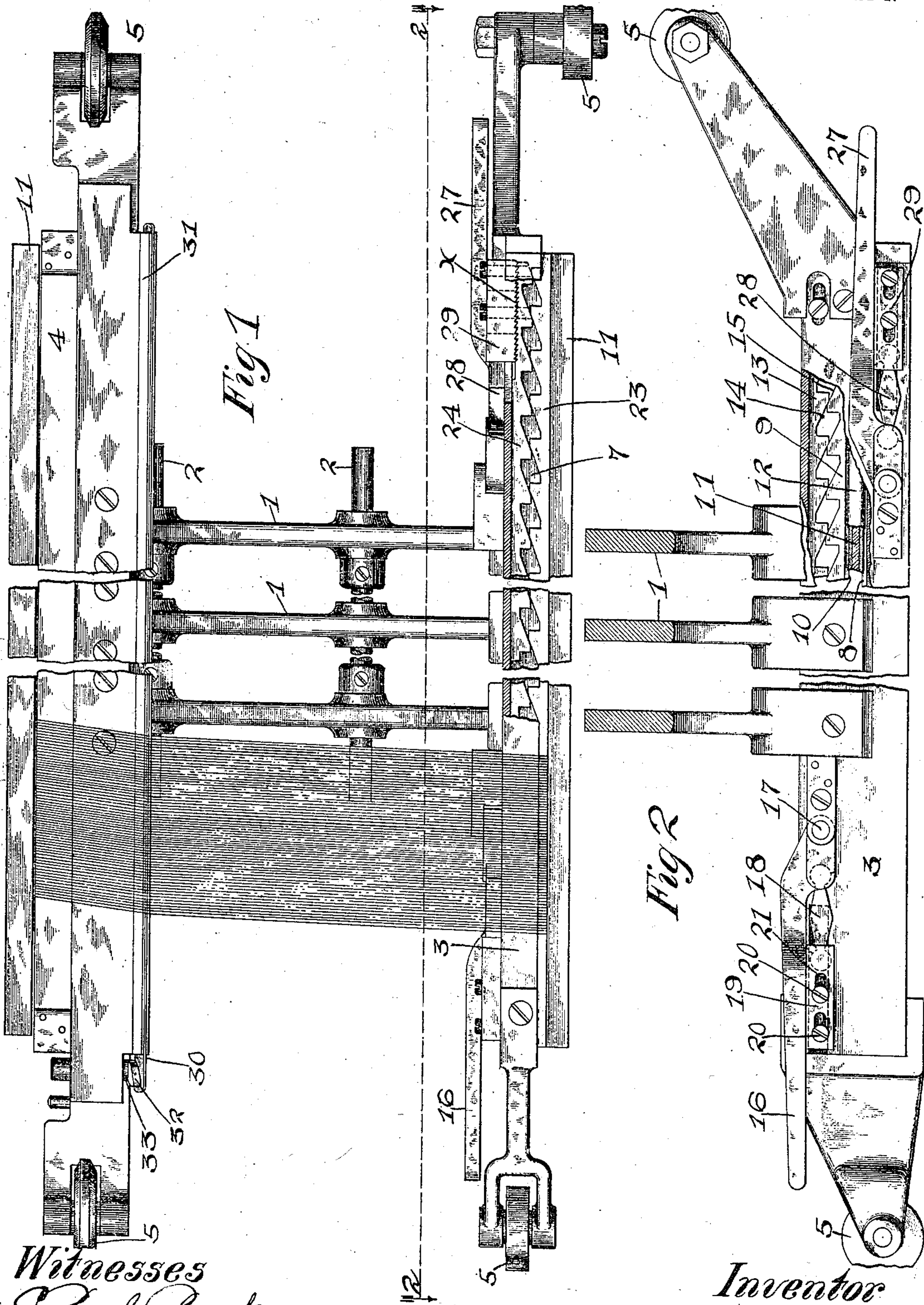


H. D. COLMAN.
 MEANS FOR CLAMPING AND STRETCHING WARP THREADS.
 APPLICATION FILED OCT. 4, 1907.

963,871.

Patented July 12, 1910.

2 SHEETS—SHEET 1.



Witnesses
 Paul Parker
 George L. Chindahl

Inventor
 H. D. Colman
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H. D. COLMAN.

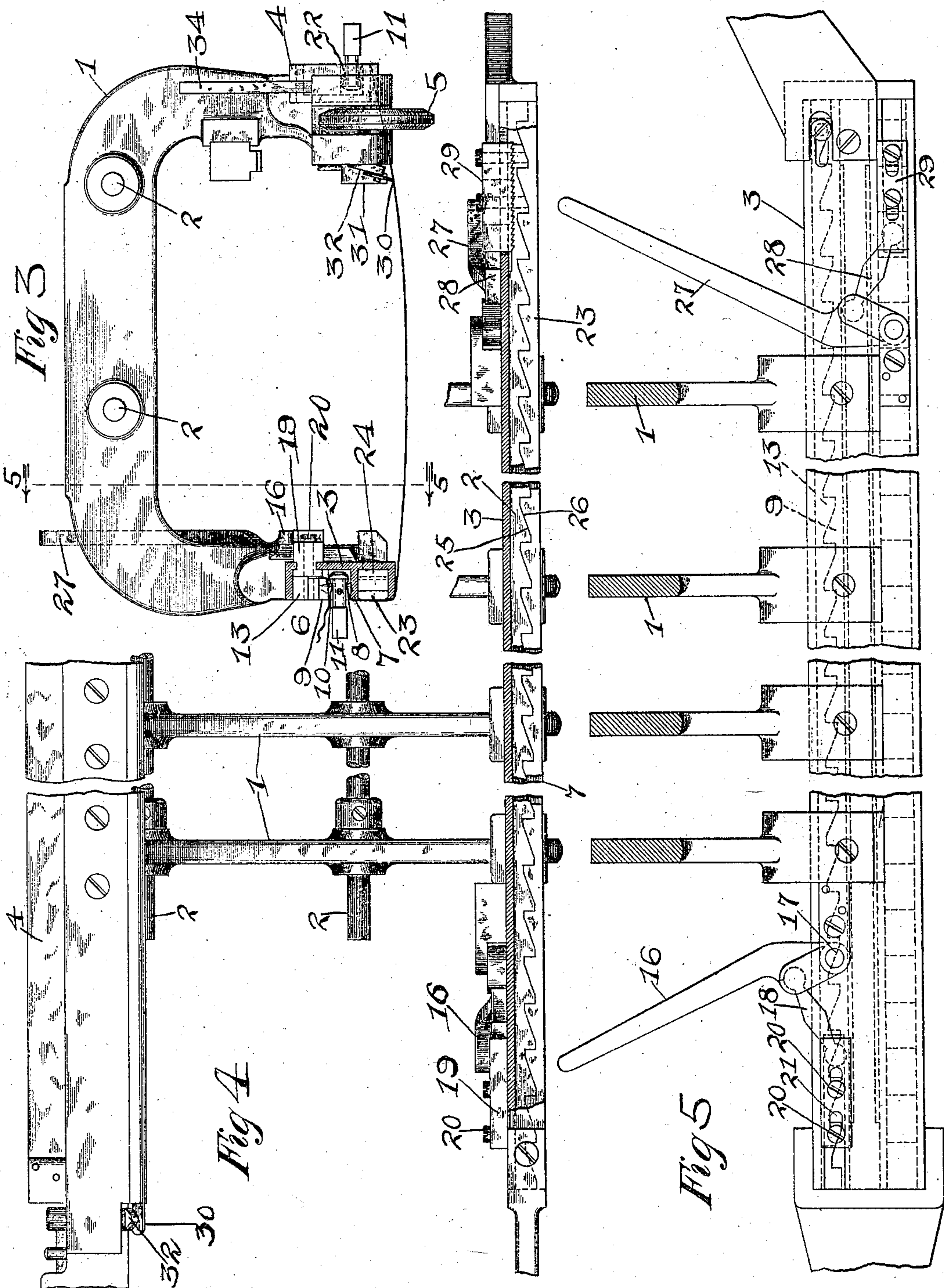
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UNITED STATES PATENT OFFICE.

HOWARD D. COLMAN, OF ROCKFORD, ILLINOIS, ASSIGNOR TO BARBER-COLMAN COMPANY, OF ROCKFORD, ILLINOIS, A CORPORATION OF ILLINOIS.

MEANS FOR CLAMPING AND STRETCHING WARP-THREADS.

963,871.

Specification of Letters Patent. Patented July 12, 1910.

Application filed October 4, 1907. Serial No. 395,884.

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 Means for Clamping and Stretching Warp-Threads and the Like, of which the following is a specification.

I will describe the invention as applied to the warp-supporting frame of a textile machine, such as the warp-tying machine disclosed in my British Patent No. 10,484, of 1905, although it will be understood that the invention is not limited to this specific use.

In the accompanying drawings, Figure 1 is a fragmental under side view of a warp carriage embodying the features of my invention. Fig. 2 is a sectional view taken on the plane of dotted line 2-2 of Fig. 1. Fig. 3 is an end elevation of the carriage. Fig. 4 is a fragmental under side view of the carriage with portions thereof in section. Fig. 5 is a view similar to Fig. 2, but showing the clamping and stretching means in the inoperative position. Fig. 5 is taken on dotted line 5-5 of Fig. 3.

The framework of the warp carriage to which my invention is herein shown as applied, comprises the yokes 1, the longitudinal rods 2, and the channel bars 3 and 4, said channel bars extending longitudinally of the carriage at opposite sides thereof. The carriage is supported in the warp-tying machine upon rollers 5. The channel bar 3 forms the framework of the warp-clamp 6. Said channel bar has a longitudinal partition or wall 7 therein, upon the upper side of which wall is a longitudinal rib 8. A clamp bar 9 mounted in the channel bar 3 is provided with a similar rib 10. The warp threads are inserted between the partition 7 and the clamp bar 9 by means of an insertion bar 11, the opposite sides of which are covered with a suitable yielding material 12, such as rubber. The clamp bar 9 is moved vertically to clamp the threads by means of a longitudinally movable operating bar 13, said operating bar having inclined teeth 14 thereon, adapted to ride up on similar teeth 15 on the clamp bar 9. In this instance, the operating bar 13 is moved by means of a hand lever 16 pivoted on the channel bar 3 at 17. The lever 16 is connected with

the operating bar 13 through the medium of a toggle link 18. One end of the toggle link 18 is connected with a block 19 adjustably attached to the operating bar 13 by means comprising, in this instance, screws 20 extending through said operating bar and through elongated openings 21 in said block. To insure a firm and rigid connection between the block 19 and the operating bar 13, the contacting surfaces of said parts may be serrated as indicated at *x* in Fig. 1. Springs (not here shown) are provided for moving the clamp bar 9 into the inoperative position.

In Fig. 5 the clamp bar 9 is shown in its elevated and inoperative position. When the hand lever 16 is pivotally moved into the position shown in Fig. 2 the operating bar 13 is moved toward the left, forcing the clamp bar 9 downward into engagement with the insertion bar 11 and the warp threads bent over said bar. The toggle link 18 is arranged to throw slightly beyond a straight line joining the pivot 17 of the hand lever and the pivotal connection between said link and the block 19, in order to lock the clamp in the closed position.

The warp clamp 22 at the opposite side of the warp carriage may be of the same construction as that just described.

The means for placing tension upon the warp threads after they have been clamped in the clamps 6 and 22 is located, in this instance, adjacent to the clamp 6. In the construction herein shown I provide a bar 23 mounted in the channel bar 3 between the partition 7 and the lower wall of said channel bar. The means herein shown for pressing the bar 23 against the sheet of threads extending between the clamps 6 and 22, to place tension thereon, comprises a bar 24 slidably mounted in the channel bar 3 and having inclined teeth 25 adapted to engage similar teeth 26 on the bar 23. The bar 24 is slid by means of a hand lever 27 connected to said bar by means of a toggle link 28, the latter being connected at one end to a block 29 adjustably attached to the bar 24. The adjustable connection between the block 29 and the bar 24 is similar to that between the parts 19 and 13. The outer edges or corners of the partition 7, the bar 23 and the lower wall of the channel bar 3 may be rounded, as shown in Fig. 3, to prevent cutting of the threads when tension is

placed upon them. Adjacent to the warp clamp 22 is located means for deflecting the threads from a straight line between the clamp 22 and the tensioning means. Said deflecting means comprises, in this instance, a serrated metallic ribbon 30 longitudinally slidable in a bar 31 fixed in the carriage frame. One end of the ribbon 30 is connected to a crank arm 32 (Fig. 1) upon one end of a rock shaft 33, a hand lever 34 (Fig. 3) being fixed to the other end of said shaft.

In use, the warp threads are clamped in the clamps 6 and 22 by placing said threads in said clamps and moving the operating lever 16 of each clamp into the position shown in Figs. 1 and 2. Tension is then placed upon the threads by moving the hand lever 27 into the position shown in Fig. 2, the bar 23 being thereby pressed against the threads. The deflecting ribbon 30 is then moved longitudinally to the left (Fig. 1) to deflect the threads slightly from a straight line between the clamp 22 and the lower side of the channel bar 3.

It will be apparent to those skilled in the art that various mechanical embodiments of the invention are possible, and I therefore do not wish to be limited to the arrangement and construction herein shown.

I claim as my invention:

1. The combination, with two stationary clamps adapted to hold threads against movement, of means for placing tension upon a sheet of threads held by said clamps.

2. The combination, with two stationary thread clamps adapted to hold threads against movement, of means located adjacent to one of said thread clamps for placing tension upon a sheet of threads held by said clamps.

3. The combination, with two stationary thread clamps, of a member over which a sheet of threads held by said clamps may extend, and means for laterally moving said member to place tension upon the threads.

4. The combination, with two thread clamps, of means arranged to be moved against the sheet of threads extending between said clamps, for placing tension upon said sheet and means for moving the first mentioned means against the sheet of threads.

5. The combination, with two thread clamps, of a bar arranged to be pressed against the sheet of threads extending between said clamps, for placing tension thereon and means for pressing said bar against the sheet of threads.

6. The combination, with two stationary warp clamps adapted to hold a sheet of

threads against movement, of sheet-tensioning means and sheet-deflecting means.

7. The combination, with means for holding a plurality of threads at two points in their length, of a bar adapted to be moved against said threads, inclined teeth on said bar, an operating bar having co-acting inclined teeth, and means for sliding said operating bar.

8. A warp carriage having stationary warp clamps at opposite sides thereof adapted to hold a sheet of threads against movement, and means for placing tension upon a sheet of threads held by said clamps.

9. A warp carriage having stationary warp clamps at opposite sides thereof adapted to hold a sheet of threads against movement; and means adjacent to one of said clamps for placing tension upon a sheet of threads held by said clamps.

10. A warp carriage having stationary warp clamps at opposite sides thereof adapted to hold a sheet of threads against movement, and means below and adjacent to one of said clamps for placing tension upon a sheet of threads held by said clamps.

11. A warp carriage having warp clamps at opposite sides thereof, a member supported below and adjacent to one of said clamps, and means for pressing said member against the sheet of threads extending between said clamps for placing tension upon the threads.

12. A warp clamp comprising a stationary member having a rib thereon, a movable clamp member having a rib thereon, an insertion bar having yielding portions adapted to be placed between said ribs, and means for moving said movable clamp member.

13. A warp clamp comprising a stationary member having a rib thereon, a movable member having a rib thereon, inclined teeth on the rear side of said movable member, an operating bar having inclined teeth adapted to co-act with the inclined teeth on said movable member, means for moving said operating member, and thread-inserting means.

14. The combination with means for holding one end of a sheet of threads, of a clamp comprising a channeled member having a longitudinal partition therein, sheet-clamping means in said channeled member at one side of said partition, and sheet-tensioning means in said channeled member at the other side of said partition.

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Witnesses:

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