

No. 724,471.

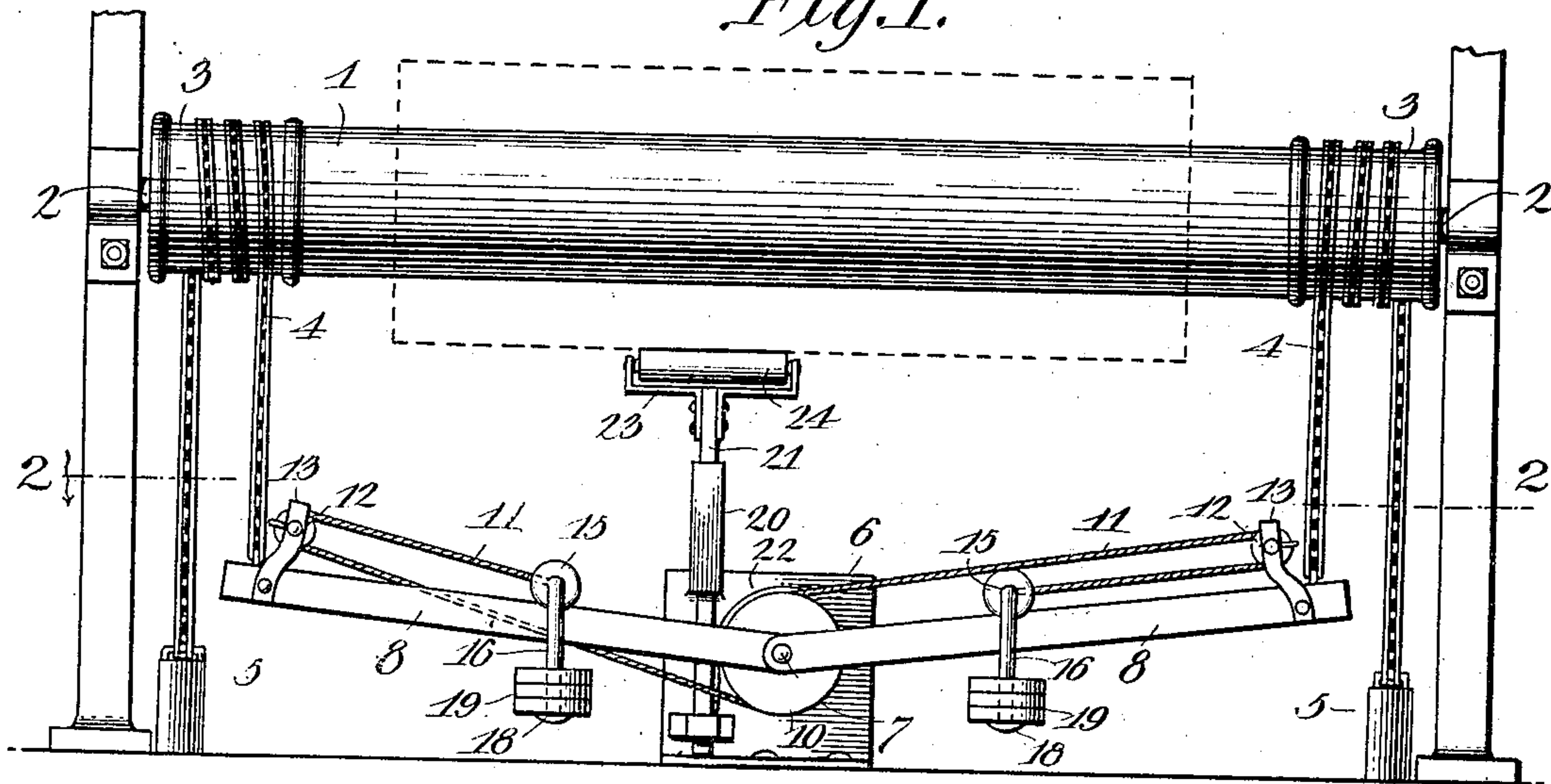
PATENTED APR. 7, 1903.

H. HAUTMANN.  
WARP TENSION MECHANISM FOR LOOMS.

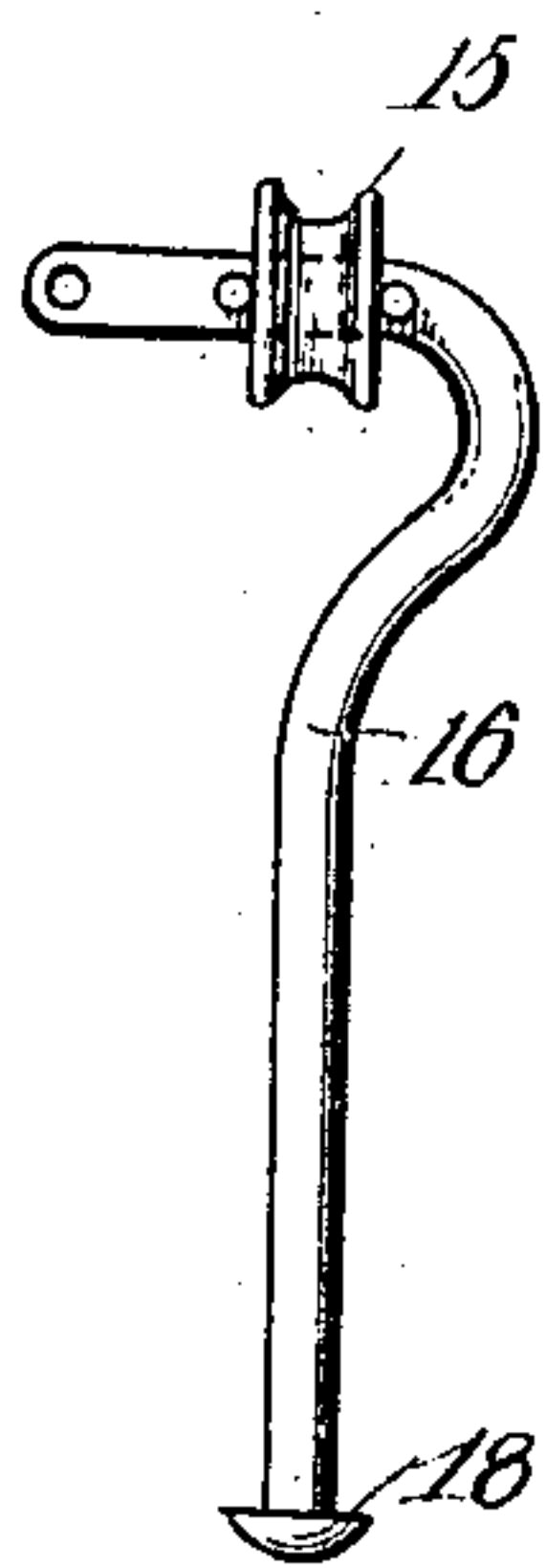
APPLICATION FILED NOV. 29, 1902.

NO MODEL.

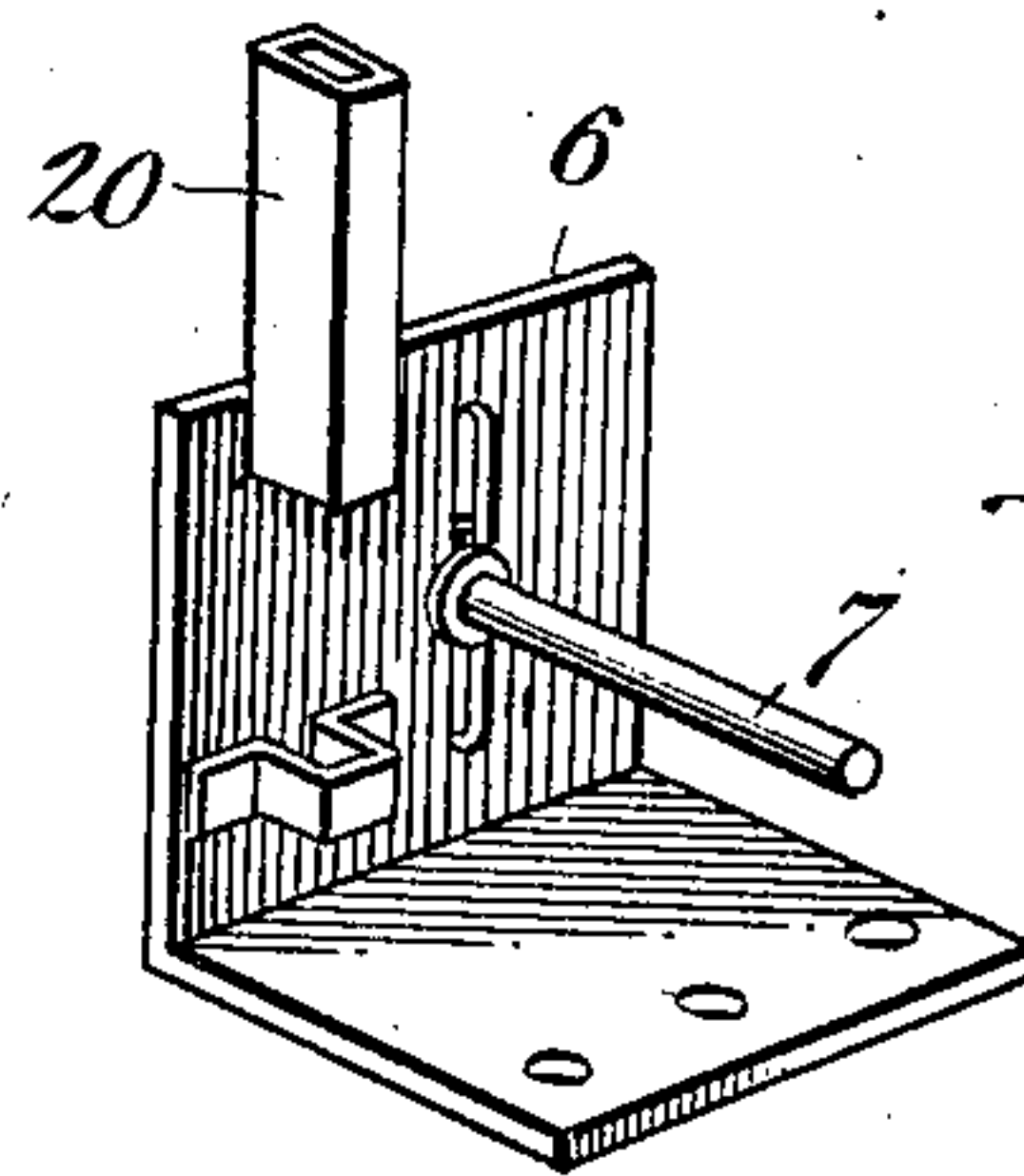
*Fig. 1.*



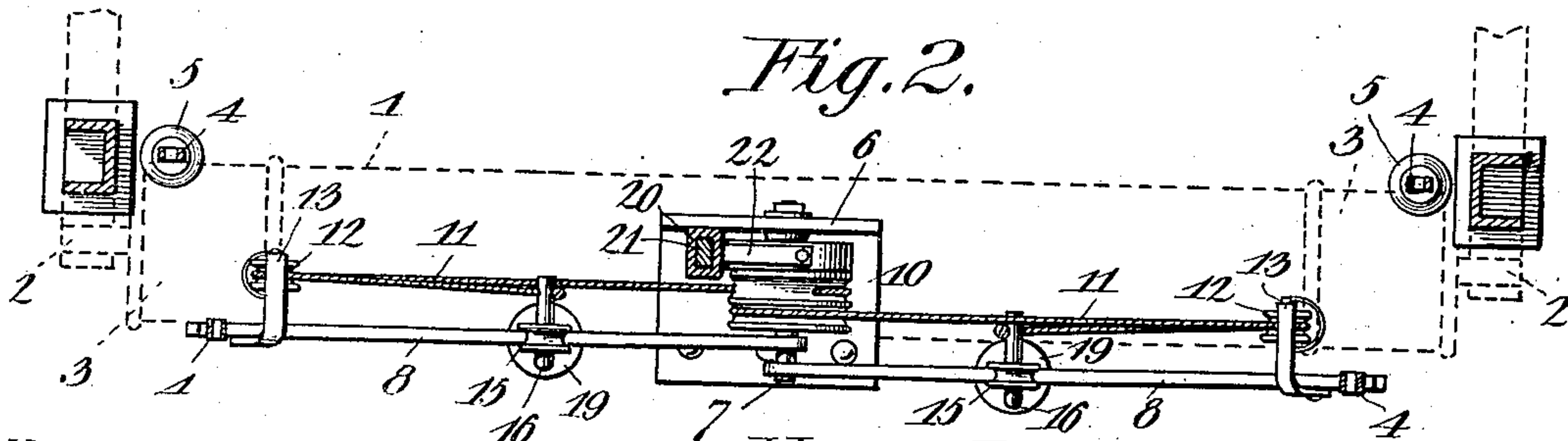
*Fig. 3.*



*Fig. 4.*



*Fig. 2.*



Witnesses

*Frank A. L. Berwell.*  
*John E. Parker*

Henry Hautmann, Inventor.  
by

*C. A. Snow & Co.*  
Attorneys



# UNITED STATES PATENT OFFICE.

HENRY HAUTMANN, OF PHILLIPSBURG, NEW JERSEY.

## WARP-TENSION MECHANISM FOR LOOMS

SPECIFICATION forming part of Letters Patent No. 724,471, dated April 7, 1903.

Application filed November 29, 1902. Serial No. 133,251. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY HAUTMANN, a citizen of the United States, residing at Phillipsburg, in the county of Warren and State of New Jersey, have invented a new and useful Warp-Tension Mechanism for Looms, of which the following is a specification.

The invention relates to certain improvements in looms, particularly to mechanism employed for holding the warp-threads under constant tension.

The principal object of the invention is to provide an automatic tension device in which the tension on the beam will be gradually decreased as the threads are withdrawn during the weaving operation in order that the threads may be held under practically the same tensional strain without regard to the quantity carried by the beam.

With this and other objects in view the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a rear elevation of sufficient of a loom to illustrate the application thereto of a tension mechanism constructed in accordance with my invention. Fig. 2 is a sectional plan view of the same on the line 2-2 of Fig. 1. Figs. 3 and 4 are views of details of construction more particularly referred to hereinafter.

In looms as now constructed and operated, particularly where warp-threads of great length are used, much difficulty is experienced in maintaining the threads under the same tension during the whole of the weaving operation. When a full beam is placed in the loom, the tension mechanism is weighted in order to hold the threads under sufficient strain to form a fabric of the desired quality; but as the warp is withdrawn from the beam it becomes necessary to gradually remove the weights to properly proportion the strain to the quantity of thread remaining. This is generally done at intervals and in many cases results in unevenness and ir-

regularity in the weaving. In carrying out my invention these difficulties are overcome by providing a mechanism which will automatically adjust the strain on the beam in proportion to the quantity of thread thereon.

In the drawings, 1 is a warp-beam of ordinary construction provided with trunnions 2 at its opposite end and supported in the loom-frame in the usual manner. At each end of the beam is a friction-drum 3, around which passes a chain 4, weights being applied to the chain in order to resist free turning movement of the beam, and one end of each chain is secured to a counterweight 5 or in some cases to a rigid lug or bracket, in accordance with the character of the loom and the class of goods to be woven.

At the central portion of the loom-frame is a standard 6, carrying a pivot-pin 7, on which are mounted two arms 8, the arms being connected at points near their outer ends with the friction chains or bands 4. The pivot-pin also supports a double drum 10, to which are secured the inner ends of a pair of flexible chains or cords 11, which extend outward toward the sides of the loom and are guided over sheaves 12, mounted in brackets 13, carried by the arms. On each arm is mounted an adjustable roller 15, having a central opening for the passage of the upper end of a weight-supporting rod 16, the rod having a horizontal portion passing through the center of the roller and provided at one end with an eye for the reception of the cord or chain 11. Each rod 16 is provided at its lower end with an enlarged knob or cross-bar 18, on which any desired number of weights 19 may be placed, the number of weights being proportioned to the quantity of warp on the beam when the latter is first placed in position in the loom and at a time when the rollers 15 are adjacent to the outer ends of the arms.

The standard 6 is provided with a vertically-disposed guideway 20 for the reception of a vertically-movable bar 21, having its lower end secured by a flexible chain or cord 22 to one side of the drum 10. The upper end of the bar 21 is provided with a bracket or yoke 23, having bearings for the reception of the ends of a follower-roller 24, which is pressed into contact with the warp-threads on the beam 1 by the action of the weights



19 in tending to travel down the inclined arms 8 toward the pivot-point of said arms.

In the operation of the device a filled warp-beam is placed in position in the loom and the rollers 15 are adjusted to positions adjacent to the brackets 13, after which the required number of weights are placed on the weight-carrying rods 16 to exert the necessary frictional contact between the cords or chains 4 and the drums around which they pass. The follower-roller 24 is kept continuously in engagement with the warp-threads, and as the warps are used during the weaving process the roller gradually moves upward, permitting the drum 10 to revolve and allowing the cords or chains 11 to unwind from said drum under the influence of the weights as the latter gradually move toward the pivot-pin 7. As the weights near the pivot point of the arms the effective leverage is of course greatly decreased, and the strain exerted on the chains or bands 4 is gradually lessened and permitting the warp-beam to turn more freely and at the same time maintain uniform tension on the threads.

The arrangement of the chains or bands 4 may be varied in accordance with the character of the loom, and in some cases may take the form of the ordinary friction-bands secured at one end to the opposite point and at the opposite end to a weighted arm, or a single weighted arm and warp-beam drum may be employed in connection with a follower without departing from the invention. Having thus described the invention, what is claimed is—

1. The combination in a loom, of the warp-beam having a friction-drum, friction devices in engagement therewith, a pivotally-mounted arm, a weight movable longitudinally of the arm, a drum mounted concentric with the

pivot-point of the arm, a flexible connection between the drum and weight to adjust the position of the latter in accordance with the position of circumferential adjustment of the drum, and a follower held against the warp-threads for adjusting the position of said drum. 45

2. The combination in a loom, of the warp-beam having a friction-drum, friction devices in engagement therewith, a pivotally-mounted arm, a roller mounted on the arm, a weight carried by the roller, a drum mounted concentric with the pivot-point of the arm, a flexible connection between the drum and the roller to adjust the position of the weight in accordance with the position of circumferential adjustment of the drum, and a follower held against the warp-threads for adjusting the position of said drum. 55 60

3. The combination in a loom, of a warp-beam having a friction-drum, friction devices in engagement therewith, a pair of pivotally-mounted arms, means for connecting said arms to the friction devices, rollers mounted on the arms, brackets carried by said arms, weights supported by the rollers, a drum mounted concentric with the arm and rollers, a vertically-disposed guide, a bar mounted therein, a roller adapted to bearings on the bar and held in contact with the warp-threads on the beam, and a flexible connection between the bar and drum to thereby adjust the position of the drum and the weighted rollers. 65 70 75

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

HENRY HAUTMANN.

Witnesses:

J. I. BLAIR REILEY,  
WALTER C. REYNOLDS.