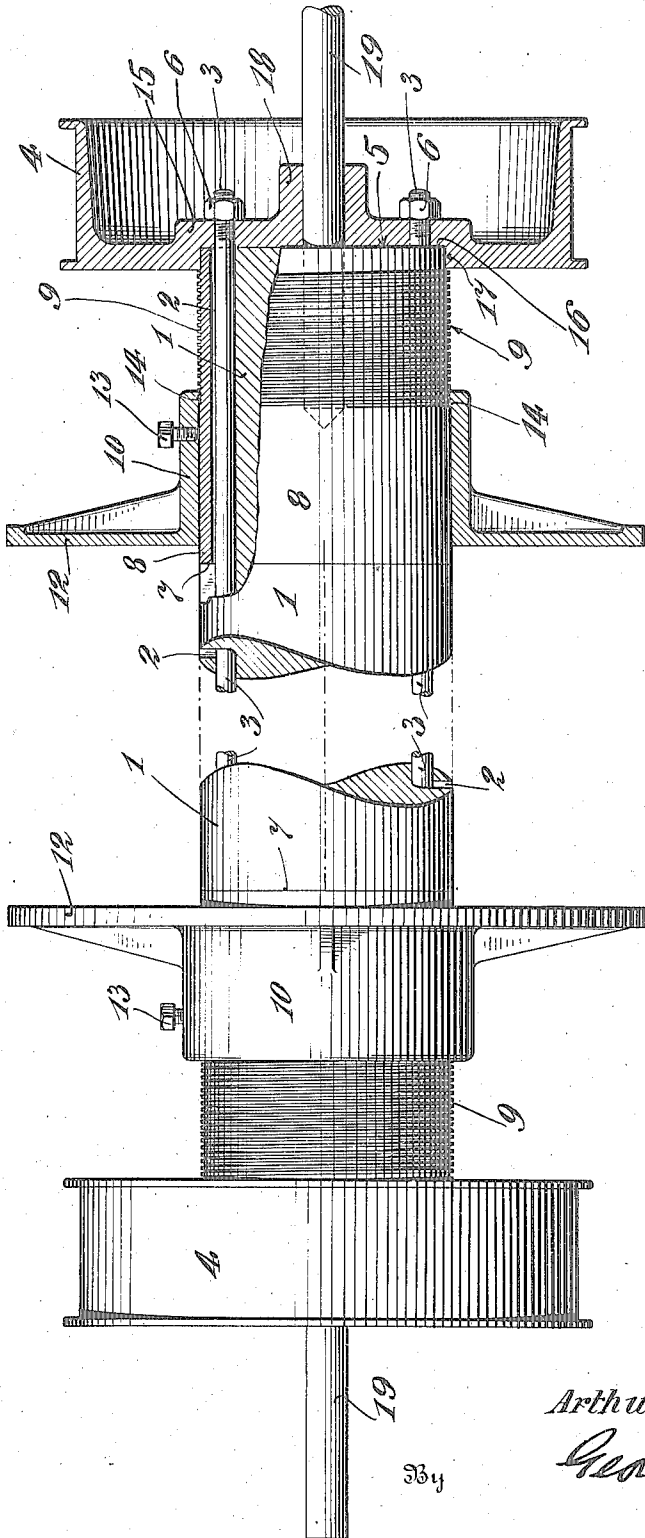


A. BALTHASAR.
 WARP BEAM AND ANALOGOUS DEVICE.
 APPLICATION FILED AUG. 13, 1921.

1,416,931.

Patented May 23, 1922.



Inventor

Arthur Balthasar

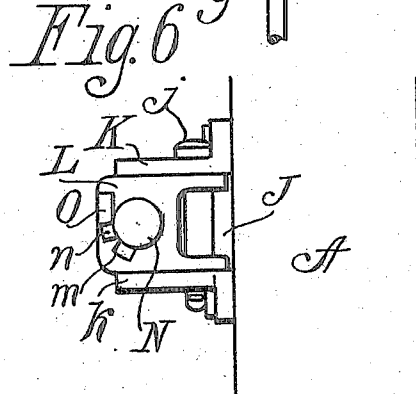
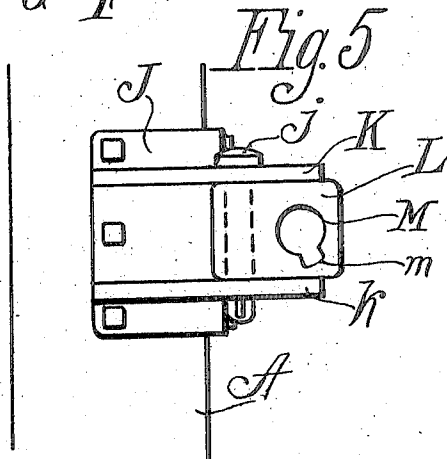
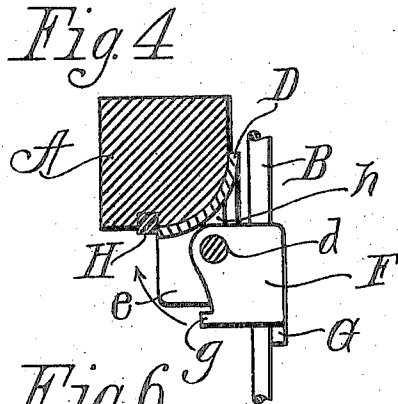
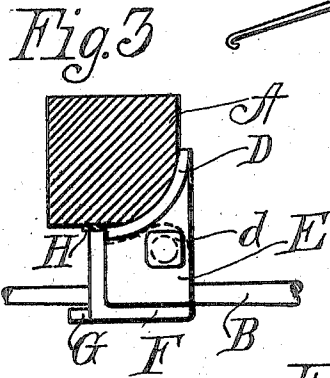
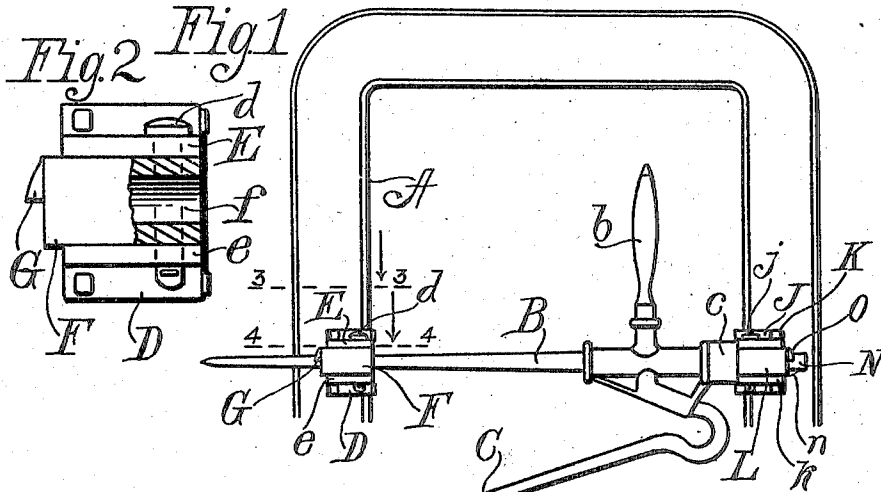
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MAIL BAG CATCHER.
APPLICATION FILED DEC. 16, 1920.

1,416,932.

Patented May 23, 1922.



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UNITED STATES PATENT OFFICE.

ARTHUR BALTHASAR, OF MONTCLAIR, NEW JERSEY.

WARP BEAM AND ANALOGOUS DEVICE.

1,416,931.

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To all whom it may concern:

Be it known that I, ARTHUR BALTHASAR, a citizen of the United States, and resident of Montclair, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Warp Beams and Analogous Devices, of which the following is a specification.

My present invention relates more particularly to supply reels of the type known as warp beams, but certain features of my invention are applicable in other relations. Warp beams commonly comprise a long roll or "barrel" on which are wound separate successive parallel spiral coils of thread for the warp of a loom. As the warp commonly comprises hundreds of separate warp threads and the length of each must be considerable in order that each "piece" of fabric woven therefrom may be of desired commercial length, the load of warp, usually silk, carried by the warp beam is very heavy, and the construction must be relatively massive in order to carry the requisite load, without sagging. In order to get the required stiffness without too great weight, the cylindrical central roll or barrel is commonly made of well-seasoned, carefully-selected, light weight wood, which is preferably made considerably longer than the width of the widest warp to be contained thereon.

As the width of the warp will be varied from time to time, the flanges which support the outer end coils of the warp must be adjustable. Much difficulty is encountered, much time wasted, and much expense incurred in effecting desired adjustments of these end flanges, for it is the universal experience that the front faces of these confining flanges must be trued to absolutely parallel planes at right angles to the axis of the roll. Otherwise, when the end threads of the warp are wound on to form the flat spiral layers supported against the respective plane faces of the flanges, said layers would be deformed, being crowded in by the intilting part of the face and permitted to fall out where the out-tilting part leaves more space. Moreover, uneven flanges would drag unevenly on the end lines of thread as they are drawn off the roll.

The general purpose of my invention is to provide a warp beam having its roll portion made of wood, for the purpose of lightness, but having the end portions, for a distance sufficient to cover the range of flange adjust-

ment desirable in practice, provided with cylindrical steel sleeves having accurately formed and sized, true-cylinder surfaces on which the hubs of the flanges are slidably mounted and on which they have a smooth sliding fit, the accuracy of which may be as perfect as desired. While the clearance, that is, the excess in diameter of the hub surface over the diameter of the sleeve surface, may be as small as desired, something like .001 of an inch, that is, .0005 on each side, will be found satisfactory. Thus formed and with a fairly long hub, it becomes impossible for the flange faces to get out of parallelism during endwise adjusting movement thereof. Consequently, there is no truing to be performed when the desired position of adjustment has been reached. The outer surface of the sleeve, between the flanges, on which the silk is wound, is unbroken by any screw threads, and the joint between flanges and sleeve is so fine that there is no danger, or even possibility, of fibres of the silk of the warp getting pinched therein.

Another feature of my invention is combining with the above true-cylinder, sliding-fit sleeve, a screw threaded surface on each sleeve extending toward the adjacent end of the barrel, this screw thread being utilized to cause or control finely graduated adjusting movement of the flange hub. A still more specific feature of the invention which is of peculiar advantage is having the screw thread on the sleeve engage directly with an internal thread projecting inward from the inner surface of the hub of the flange, whereby endwise adjusting is effected merely by rotating the flange. The screw threads on the outer surface of the sleeve are square topped, the tops lying in and constituting continuations of the true cylinder bearing surfaces of the sleeve. Consequently, when a flange hub is screwed toward the end of the roll, the thread tops on the sleeve afford a perfect guide surface for the smooth part of the inner surface of the hub. The length of the screw threaded portion with respect to the smooth portion of the sleeve is preferably proportioned so that the flange hub cannot be screwed toward the ends far enough to uncover the screw threads. The ends of the sleeves afford true rigid bearing surfaces for the tension drums that are bolted to the ends of the roll.

The above and other features of my in-

vention may be more fully understood in the following description in connection with the drawing in which the figure is an elevation of a complete warp beam partly in section.

In the drawings, the flange, sleeve, and other parts at the ends of the roll are shown in true proportions, and the actual sizes of the parts, for one type of warp beam, may be scaled from the diameter of the flange which, in this particular case, measured between 9 and 10 inches. All of the central portion of the barrel, which may be very long, is broken away, the portion not shown being a continuation of and identical with the portion that is shown on either side thereof.

The wooden barrel 1 is longitudinally grooved at 2, 2, to receive bolts 3, 3, which clamp the tension drums 4, 4, against the ends 5 of the barrel by means of nuts 6, 6.

The construction at the ends being similar and symmetrical, only the right hand end which is sectioned for the purpose need be described in detail.

The barrel is turned off at the ends so as to form a square shoulder 7 to a depth equal to the thickness of sleeve 8. The sleeve is fitted over this turned off portion, and against the shoulder 7 very accurately and very tightly. Externally the sleeve is formed as a true cylinder of great accuracy. The outer half has a screw threaded portion 9, the threads of which are cut into the cylinder, leaving the tops square, their top surfaces being in fact the original true-cylinder surface. The threads may be about eight to an inch and square sided as shown.

The remainder of the sleeve, for a distance preferably at least equal to the threaded portion, forms the above described sliding bearing surface of the hub 10 of the flange 12. The length of the hub 10 is preferably equal to or greater than the length of the smooth portion of the sleeve, so that in the proportions shown the extreme wobble permitted by a bearing surface clearance of .001, or less, would be imperceptible and entirely negligible so far as concerns its effect in permitting angular displacement of front plane of flange 12 from its desired position, which is exactly at right angles to the axis of the barrel.

The hub may be moved to and fro by hand and then locked in any desired position by means of set screw 13, but in view of the accuracy of the setting required it is preferable that the screw thread 9 be utilized in effecting such adjustment. While a screw collar having thrust or swivel engagement with hub 10 might be employed, there is great practical advantage in simply forming the interior surface of the hub with the inwardly projected screw threads 14.

By the latter construction the guiding and

truing function of the hub is separated from and made independent of the screw adjustment function, although both are combined in each of the two elements, namely, the inner metallic face of the hub and the outer metallic face of the sleeve.

The use of the sleeve 8 affords a more rigid bearing for the web 15 of the friction drum, the end surface 16 of the sleeve affording a thrust surface presented parallel with the axis and the outer surface 17, a peripheral surface of engagement, whereby, when bolted together, the parts mutually center and hold each other. The centering is also assisted by the hub 18 which fits the arbor 19 upon which the end warp beam is rotatably mounted.

While I have disclosed precisely the construction, proportions and dimensions of a preferred embodiment of my invention, it will be obvious that many variations are possible and are within the spirit of my invention. For instance, it is permissible and may prove desirable to cut away or relieve one or the other of the long bearing surfaces on hub or sleeve, thereby decreasing the surface of contact and the resulting friction without in any wise impairing the accuracy of the sliding fit.

I claim:

1. A roll having radially projecting, annular members, the hub portions of said members having internal smooth, true-cylinder, bearing surfaces and smooth, metal, true-cylinder bearing surfaces on the roll, fitting said hub surfaces very accurately, the length of said metal bearing surface on the roll being equal to or greater than the desired range of adjustment of the flanges, and, beyond said smooth bearing surfaces on the roll, and coaxial therewith, a threaded surface, the thread being depressed to a smaller radius than said smooth surface of the roll, and means engaging said threads arranged to force said hub and flange away from the end of the roll.

2. A roll having radially projecting, annular members, the hub portions of said members having internal smooth, true-cylinder, bearing surfaces and smooth, metal, true-cylinder bearing surfaces on the roll, fitting said hub surfaces very accurately, the length of said metal bearing surface on the roll being equal to or greater than the desired range of adjustment of the flanges, and, beyond said smooth bearing surfaces on the roll, and coaxial therewith, a threaded surface, the thread being depressed to a smaller radius than said smooth surface of the roll, and means engaging said threads arranged to force said hub and flange away from the end of the roll, said means consisting of threads integral with one end of the hub and projecting inwardly from the smooth cylindrical surface thereof.

3. A roll having cast metal, plane faced, radially projecting annular flanges and integral hubs, the inner bearing surfaces being smooth, true-cylinder surfaces and smooth, metal, true-cylinder bearing surfaces on the roll, fitting said hub surfaces very accurately, the length of said metal bearing surface on the roll being equal to or greater than the desired range of adjustment of the flanges and, beyond said smooth bearing surfaces on the roll, and coaxial therewith, a threaded surface, the thread being depressed to a smaller radius than said smooth surface of the roll, and means engaging said threads arranged to force said hub and flange away from the end of the roll.

4. A roll having cast metal, plane faced, radially projecting annular flanges and integral hubs, the inner bearing surfaces being smooth, true-cylinder surfaces and smooth, metal, true-cylinder bearing surfaces on the roll, fitting said hub surfaces very accurately, the length of said metal bearing surface on the roll being equal to or greater than the desired range of adjustment of the flanges and, beyond said smooth bearing surfaces on the roll, and coaxial therewith, a threaded surface, the thread being depressed to a smaller radius than said smooth surface of the roll, and means engaging said threads arranged to force said hub and flange away from the end of the roll, said means consisting of threads integral with one end of the hub and projecting inwardly from the smooth cylindrical surface thereof.

5. A roll having oppositely facing limiting flanges slidably mounted thereon, the opposed faces of the flanges being formed as true planes parallel with each other and at right angles to the axis of the roll and integral hubs for the respective flanges being located wholly on the outer side of said plane faces and extending toward the respective ends of roll, the bearing surfaces within the respective hubs and on the roll being accurately-fitted true-cylinder, metal surfaces, the length of said surfaces, both on the roll and in the hub being at least equal to the distance of the desired longitudinal adjustment of the flange; and the roll being formed beyond the respective cylindrical bearing surfaces with screw thread grooves below the level of said bearing surface extending toward the end of the roll, and means engaging the respective threads arranged to screw-adjust the respective hubs away from the end of the roll and means for locking the parts in the adjusted position.

6. A warp beam comprising a long wooden barrel, the surface of which is a true-cylinder consisting of the wood exposed along the intermediate portion of its length and heavy metal sleeves near each end, cast-metal, plane faced, radially projecting annular flanges and integral hubs, the inner bearing sur-

faces of which are smooth, true-cylinder surfaces; and smooth, metal, true-cylinder bearing surfaces on sleeves, fitting said hub surfaces very accurately, the length of said metal bearing surface of the sleeve being equal to or greater than the desired range of adjustment of the flanges and, beyond said smooth bearing surfaces on the sleeve, and forming an extension of said true cylinder surface, a threaded surface, the thread being depressed to a smaller radius than said smooth surface, and means engaging said threads arranged to force said hub and flange away from the end of the roll.

7. A warp beam comprising a long wooden barrel the surface of which is a true cylinder consisting of the wood exposed along the intermediate portion of its length and heavy metal sleeves near each end, cast-metal, plane faced, radially projecting annular flanges and integral hubs, the inner bearing surfaces of which are smooth, true-cylinder surfaces; and smooth, metal, true-cylinder bearing surfaces on sleeves, fitting said hub surfaces very accurately, the length of said metal bearing surface of the sleeve being equal to or greater than the desired range of adjustment of the flanges and, beyond said smooth bearing surfaces on the sleeve, and forming an extension of said true cylinder surface, a threaded surface, the thread being depressed to a smaller radius than said smooth surface, and means engaging said threads arranged to force said hub and flange away from the end of the roll, said means consisting of threads integral with one end of the hub and projecting inwardly from the smooth cylindrical surface thereof.

8. A warp beam comprising a cylindrical wooden barrel having at the end portions thereof, heavy metal cylindrical sleeves of the same external diameter as the barrel; and slidably mounted on said sleeves, oppositely facing cast metal flanges, the opposed faces of the flanges being formed as true planes parallel with each other and at right angles to the axis of the roll and integral hubs for the respective flanges, located wholly on the outer side of said plane faces and extending toward the respective ends of beam, the bearing surfaces within the respective hubs and on the sleeves being accurately-fitted, true-cylinder, metal surfaces, the length of said surfaces, both on the sleeves and in the hubs being at least equal to the distance of the desired longitudinal adjustment of the flange; and the sleeves being formed beyond the respective cylindrical bearing surfaces each with screw thread grooves below the level of said bearing surface extending toward the adjacent end of the beam; and threads inwardly projecting from the outer ends of the hubs and engaging the respective threads to screw-adjust the respective hubs toward and away from

the adjacent end of the beam and means for locking the hub in the adjusted position.

9. A warp beam comprising a cylindrical wooden barrel having at the end portions thereof, heavy metal cylindrical sleeves of the same external diameter as the barrel; and slidably mounted on said sleeves, oppositely facing cast metal flanges, the opposed faces of the flanges being formed as true planes parallel with each other and at right angles to the axis of the roll, and integral hubs for the respective flanges, located wholly on the outer side of said plane faces and extending toward the respective ends of beam, the bearing surfaces within the respective hubs and on the sleeves being accurately-fitted, true-cylinder, metal surfaces, the length of said surfaces, both on the sleeves and in the hubs being at least equal to the distance of the desired longitudinal adjustment of the flange; and the sleeves being formed beyond the respective cylindri-

cal bearing surfaces each with screw thread grooves below the level of said bearing surface extending toward the adjacent end of the beam; and threads inwardly projecting from the outer ends of the hubs and engaging the respective threads to screw-adjust the respective hubs toward and away from the adjacent end of the beam and means for locking the hub in the adjusted position, said wooden barrel being formed with plane ends and with grooves extending from end to end along opposite sides of its periphery; friction drums having webs bearing on the ends of the metal sleeves and clamping bolts extending through said webs and grooves from end to end of the barrel, clamping said parts in fixed relation.

Signed at New York in the county of New York and State of New York this 10th day of August, A. D. 1921.

ARTHUR BALTHASAR.