Nov. 1, 1932. F. KLEIN 1,885,114

CREEL

Filed March 27, 1931 3 Sheets-Sheet 1

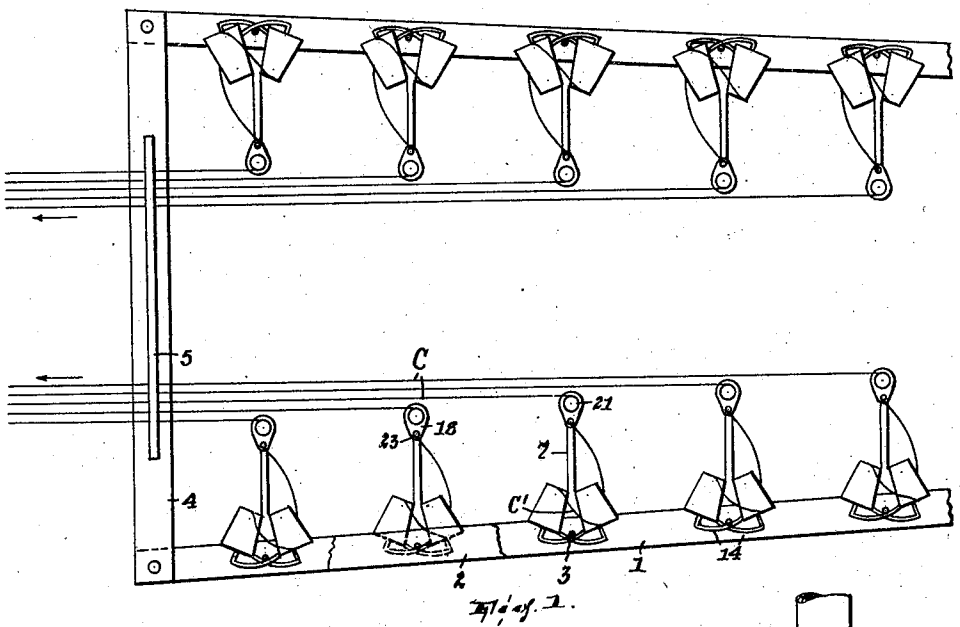


Fig. 1.

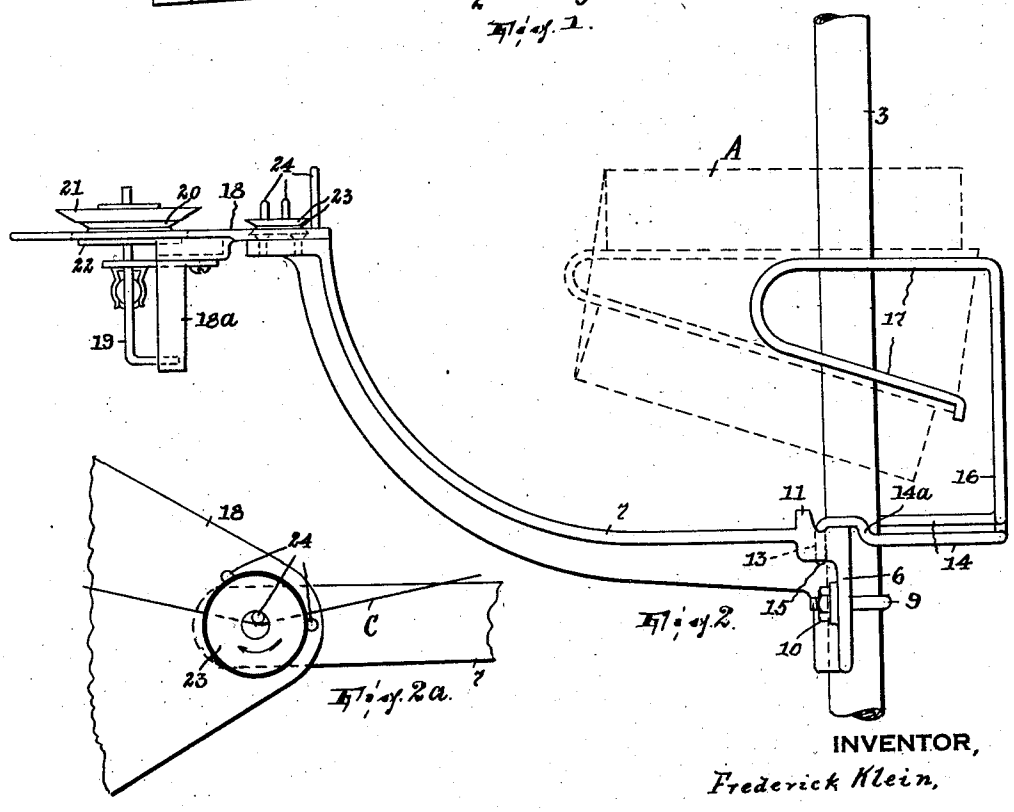


Fig. 2.

Fig. 2a.

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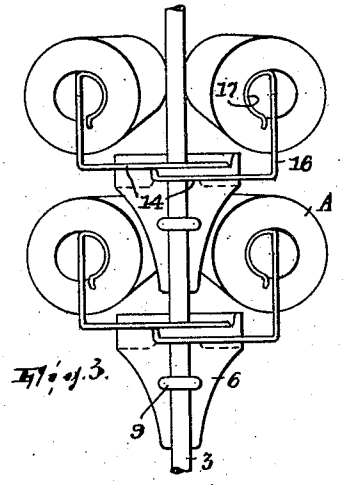


Fig. 3.

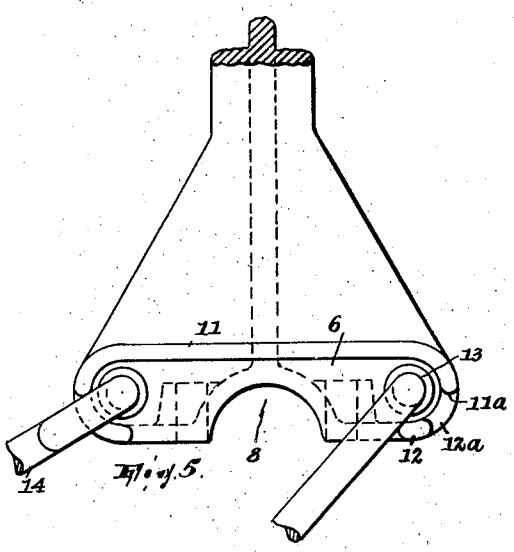


Fig. 5.

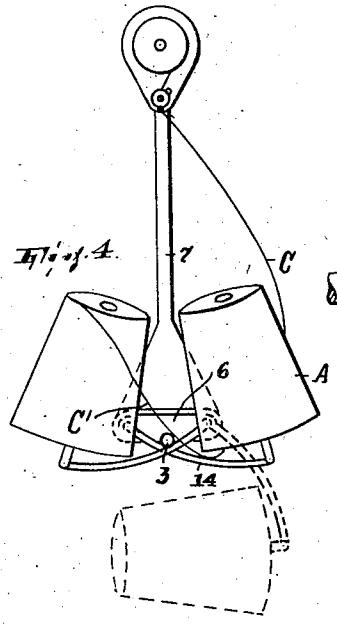


Fig. 4.

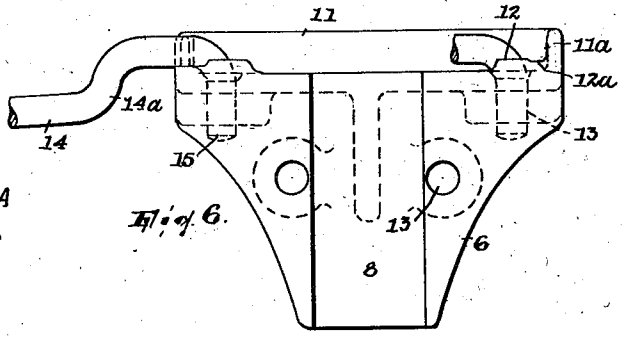


Fig. 6.

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CREEL

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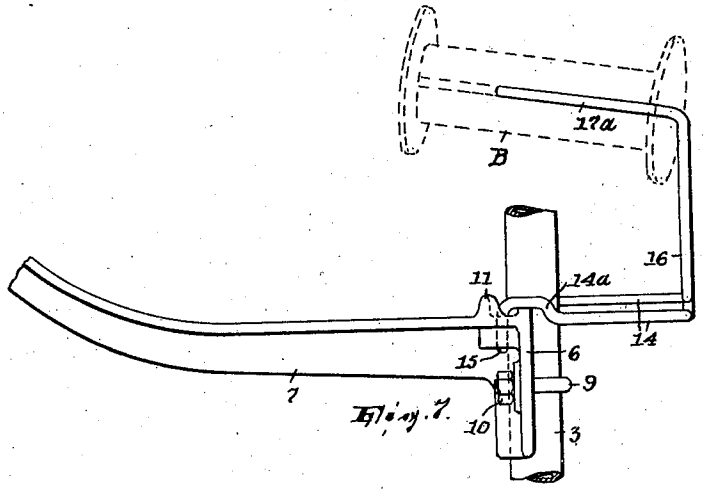


Fig. 7.

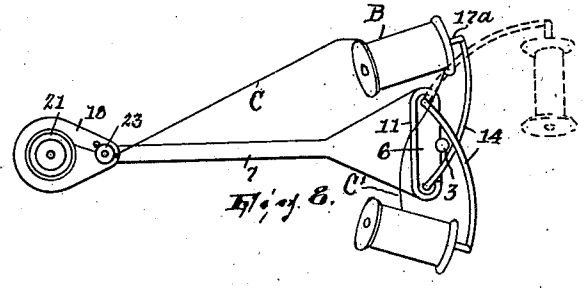


Fig. 8.

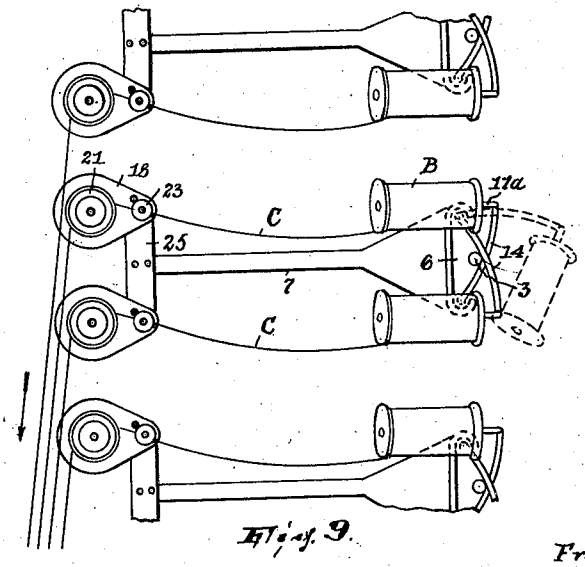


Fig. 9.

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3459-3E BY his ATTORNEY

Patented Nov. 1, 1932 1,885,114

UNITED STATES PATENT OFFICE

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CREEL

Application filed March 27, 1931. Serial No. 525,801.

This invention relates to creels for supporting wound yarn packages from which yarns are drawn, as in the operation of preparing a warp, and particularly to that class of creels in which there is provision for shifting any package from its normal yarn delivering position to a position convenient to the operator for substituting an exhausted package by a fresh one. One object of the invention is to construct the creel so as to accommodate as many packages in a given area as possible and yet allow the shifting of any package to the position for doffing and substituting a fresh one, with ample clearance for that purpose. Another object is to construct a creel so as to simplify the same and reduce the cost of manufacture and of assembling its various parts and permit the ready placement of the elements of each unit involved in the delivery of the yarn and its tensioning or guiding means in different elevations on the frame or main supporting structure in any arrangement desired or required by the number of such units to be present.

I attain my first object by arranging the packages in groups of two and mounting each two packages on carriers which are pivoted on substantially parallel axes and, when the packages are in working or delivering position, lap (as cross) each other between their packages and their pivots.

I attain my second object by constructing each yarn supply (which I here mean to include, with yarn tensioning or other guiding means, means to support the latter and also a yarn package with the axis of the latter substantially alined with said means) as a unitary structure attached to the frame, being preferably adapted to assume various positions therein. In the example the frame has uprights or standards and these unitary structures are each adapted to be clamped to a standard at any elevation so that at any such elevation the alined relation of the guiding means and package axis shall be substantially horizontal.

In the drawings,

Fig. 1 is a plan of a creel embodying the improved yarn supplies;

Fig. 2 is a side elevation of one such supply with the wound package shown in broken outline.

Fig. 2*a* is a plan of a fragment of Fig. 2;

Fig. 3 is a rear elevation of two of the supplies;

Fig. 4 a plan thereof;

Figs. 5 and 6 a fragmentary plan and rear elevation on a larger scale;

Figs. 7 and 8 are a side elevation and plan showing wound packages in the form of spools instead of cones; and

Fig. 9 shows a modification.

Any suitable frame may be used. In the present example it is shown as including two upright converging grid-like structures each comprising a lower horizontal rail 1, a top horizontal rail 2 and bars or uprights (as pipes or tubes) 3 rigidly connecting them, only a fragment of one top rail appearing on Fig. 1. The ends of the structures may be connected by braces 4 (only the bottom one at the wider end of the creel being shown) and at the wider end of the creel there may be a reed 5 or equivalent means for keeping separated those yarns which lie all in the same horizontal plane.

Each yarn supply here includes a bracket, a wound package carrier (in the preferred form two such carriers) mounted therein and a tension (or guiding) means. It is attached to one of the uprights 3 as a unit and is capable of adjustment up or down thereon as such, as will appear.

The bracket includes a body part 6 and an arm 7 projecting rigidly and forwardly therefrom. The body part is adapted to bear against one of the uprights 3 and for this purpose it has a rear groove 8 to receive the same. It forms one member of a clamp the other member of which is a U-shaped clip 9 which embraces the upright and has its ends threaded and penetrating the body part and provided with clamping nuts 10. At the top it has an upstanding horizontal frontal ledge 11 to guide loose yarn ends and loops, the ends of which form upright rearwardly facing stops 11*a*, and at the top and back it has at each side an upstanding lug 12, each lug being spaced from stop 11*a* by a notch 12*a*. It also has an open-top bearing hole 13 between

the ledge 11 and each lug 12. The arm 7 curves upwardly and terminates in a flat top seat.

In the present example each bracket supports two yarn-package carriers. These are constructed so that in working position each of their two packages will be arranged with its axis alined with the tension means at the end of the arm 7, and so that each may be swung back into convenient position for doffing the package, and so that, further, the equipment comprising the carriers and packages will occupy the minimum of space and not interfere with each other when either is moved from or to either working or doffing position. Each carrier has a trunnion to enter a bearing hole 13 and a spindle portion to enter the axial hole of the package A. It is here a piece of heavy but resilient wire having a body part 14, one end portion bent off in one direction to form the trunnion 15 and the other and considerably longer end portion bent off in the other direction to form a standard or upright portion 16 and itself bent off and formed with a tapering return 17 which constitutes what I have termed the spindle to enter the axial hole of package A which is assumed to have such hole too small to admit the tapering spindle without jamming, which thus grips and holds the package. An important feature of my invention is here to be noted: The arrangement of the two carriers for any bracket is such (Figs. 1, 4, 8 and 9) that when the packages are in working position the spindle and trunnion of each carrier are at opposite sides of the upright 3, so that their body parts 14 lap each other (or here intersect), thus producing a most compact arrangement while permitting each loaded carrier to be swung to doffing position (dotted lines Fig. 4) with ample clearance for doffing and without interference with the other loaded carrier. Otherwise stated, in the working position each pivoted carrier here crosses the corresponding upright 3 between its pivot and package or load carrying portions. In the working position of a carrier its body part is interposed between upright 3 and lug 12; when it is in doffing position it is between lug 12 and stop 11*a*, or engaged in notch 12*a*. To move it from either position requires simply sufficient force to cam it over the lug. Since the pivoting level of the two carriers is here the same the body part of one may have a portion thereof bent downward, as at 14*a*, Figs. 2, 5 and 6, to clear the corresponding portion of the other when they are in their crossing relation to each other. Whereas the two carriers are of the same radial extent and support the packages in the same horizontal plane, since they are arranged to cross each other when in the working position on their being moved from this position each package will clear the other package.

If the package is not a cone, as in Figs. 1 to 4, with a large axial hole, but consists of windings on a spool or other core B having a small hole, as the spools in Figs. 7 to 9, the bent-off portion 16 may have its bent-off extremity or spindle plain, or without the return, as at 17*a* in these latter figures.

With respect to a radius from its pivot at 13 each carrier has its package supporting portion or means 17 arranged to support the package with its axis crossing and substantially perpendicular to such radius and the yarn package is arranged on said means so as to be crossed substantially midway of its length by said radius. Therefore, while each yarn package may stand in delivering position with its axis alined with the yarn guiding means at the end of arm 7, in swinging from that position the arc of travel of the extreme point of the entire swinging structure is one of the shortest possible radius, whereby a greater number of such structures side by side can be accommodated in the frame than would otherwise be possible.

The tension means (incidentally also a guiding means) herein set forth for example, and preferred, is essentially the same as that set forth in my copending application Serial No. 525,600, filed March 27, 1931. For the present purpose it is sufficient to describe it briefly as follows: On the end of arm 7 is a plate 18 having a depending leg 18*a* in which a spindle 19 is pivoted to rock toward and from the observer in Fig. 2, being suitably limited to a short arc of movement and normally urged from the observer, as by gravity. On this spindle is a revoluble pulley 20 subject to the braking action of a weighted non-revoluble disk 21 resting on the pulley and pressing it against a non-revoluble support 22 on the spindle. The yarn C extends from the package A (or B) to and around the pulley in at least one complete turn and then toward the observer (compare also with Fig. 1). Draft on the yarn, if the pulley is snubbed thereby, is opposed (here) by two forces, i. e., the force normally holding the spindle and pulley from the observer in Fig. 2 and the braking action exerted on the pulley. This snubbing is here effected by a light drag on the yarn between the pulley and package A (or B) produced by two superposed disks 23 confined in superposed relation to each other by three pins 24, but not so that gravity acting on the top disk will not be free to urge it toward the lower disk with consequently a certain degree of pressure on the yarn (which travels between them and is bent in an angle around the central pin) and thus creates the drag.

In Figs. 1 to 8 one such tension (guiding) means serves two packages, and the spindles of the latter are arranged so that the axes of said packages converge toward such tension means, common to them. In Fig. 9 the arm

7 has a cross-extension 25 carrying two such means, one for each package, whose spindles are so arranged that the axes of the two packages are alined with the respective tension means.

When the creel is operating each yarn extends from one of the two packages of a supply to and around its tension (guiding) means and then to and through the reed or equivalent (Fig. 1). The supplies may be superposed on each upright in any number (Fig. 3), those at any one level delivering their yarns in a horizontal sheet. That package of any supply which at a given time is delivering yarn has its tail end (or the end first wound in forming the package) spliced, as at C' by the attendant to the leading end (or end last wound on) of the companion package according to the well known custom. When the first package is exhausted the yarn will thus proceed to deliver from the second one without interruption, the attendant then replacing the first package by a fresh one and splicing the tail end of the yarn of the second package to the leading end of the fresh package; and so on. The attendant's position for these purposes, it will be seen, is outside of the creel.

Having thus fully described my invention what I claim is:

1. In a creel, the combination of supporting structure and a pair of yarn package carriers pivoted therein on substantially parallel axes and lapping each other and each pivotally movable on its pivoting axis, said carriers having means to support packages with the package axes extending in the same general direction when the carriers lap each other.

2. In a creel, the combination of supporting structure and a pair of yarn package carriers pivoted therein on substantially parallel axes and lapping each other and each pivotally movable on its pivoting axis, said carriers having means to support packages in substantially the same plane penetrated by said axes and with the package axes extending in the same general direction when the carriers lap each other.

3. In a creel, the combination of supporting structure and a pair of yarn package carriers pivoted therein on substantially parallel axes and lapping each other and each pivotally movable on its pivoting axis, said carriers having means to support packages with the package axes extending in the same general direction when the carriers lap each other and said structure having means to limit the pivotal movement of the carriers in the direction to cause them to lap each other.

4. In a creel, the combination of supporting structure and a pair of yarn package carriers pivoted therein on substantially parallel axes and lapping each other and each pivotally movable on its pivoting axis, said carriers having means to support packages with the package axes extending in the same general direction when the carriers lap each other and said structure having means, arranged to oppose the carriers between their pivots and package-carrying means, for limiting the pivotal movement of the carriers in the direction to cause them to lap each other.

5. In a creel, the combination of an upright supporting element and a pair of yarn-package carriers pivoted to said element at opposite sides thereof on substantially vertical axes and each movable into and out of simultaneous lapping relation to the other and crossing relation to said element and having means to support a yarn package.

6. In a creel, the combination of supporting structure, and a yarn-package carrier arranged on said structure and consisting of a wire bent to form a substantially horizontally extending body portion, a down-bent pivot at one end of the body portion and having a bearing in said structure, and an upright portion extending from the body portion remote from the pivot and having means to support a yarn package with its axis angularly related to said pivot.

7. In a creel, the combination of supporting structure, and a yarn-package carrier arranged on said structure and consisting of a wire bent to form a substantially horizontally extending body portion, a down-bent pivot at one end of the body portion and having a bearing in said structure, an upright portion extending from the body portion remote from the pivot and a returned spindle-forming portion extending in angular relation to the pivot.

8. In a creel, the combination of supporting structure, a yarn-package carrier pivoted to said structure on a fixed axis and including means removed from said axis to support a yarn package with its axis crossing and substantially perpendicular to a radius from the first axis, and a yarn package arranged on said means to be crossed substantially midway of its length bysaid radius.

In testimony whereof I affix my signature.

FREDERICK KLEIN.