Oct. 31, 1950 L. E. BRYANT 2,527,700

PORTABLE LOOM CREEL AND TENSIONING MEANS THEREFOR

Original Filed July 26, 1945 3 Sheets-Sheet 1

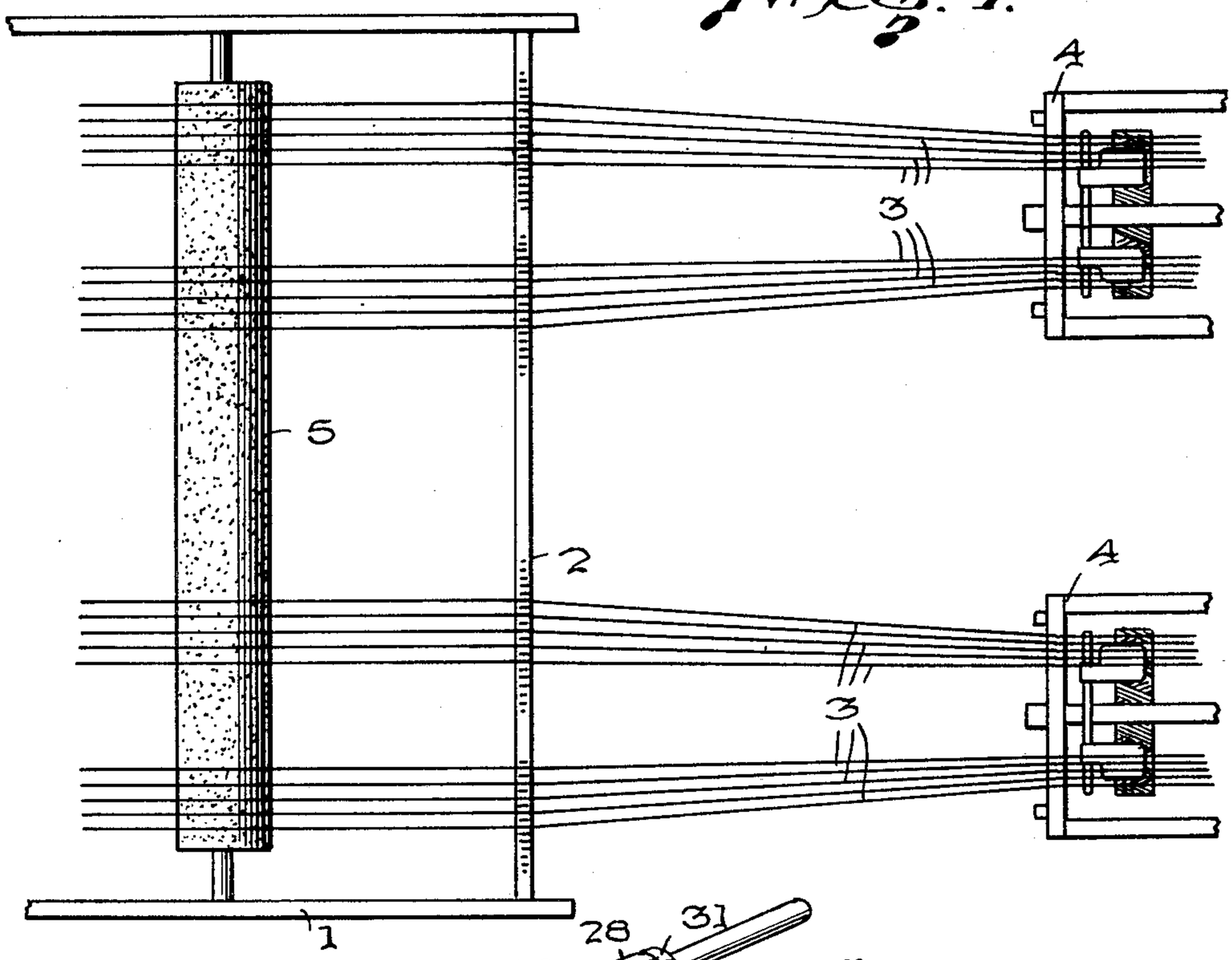

Fig. 1.

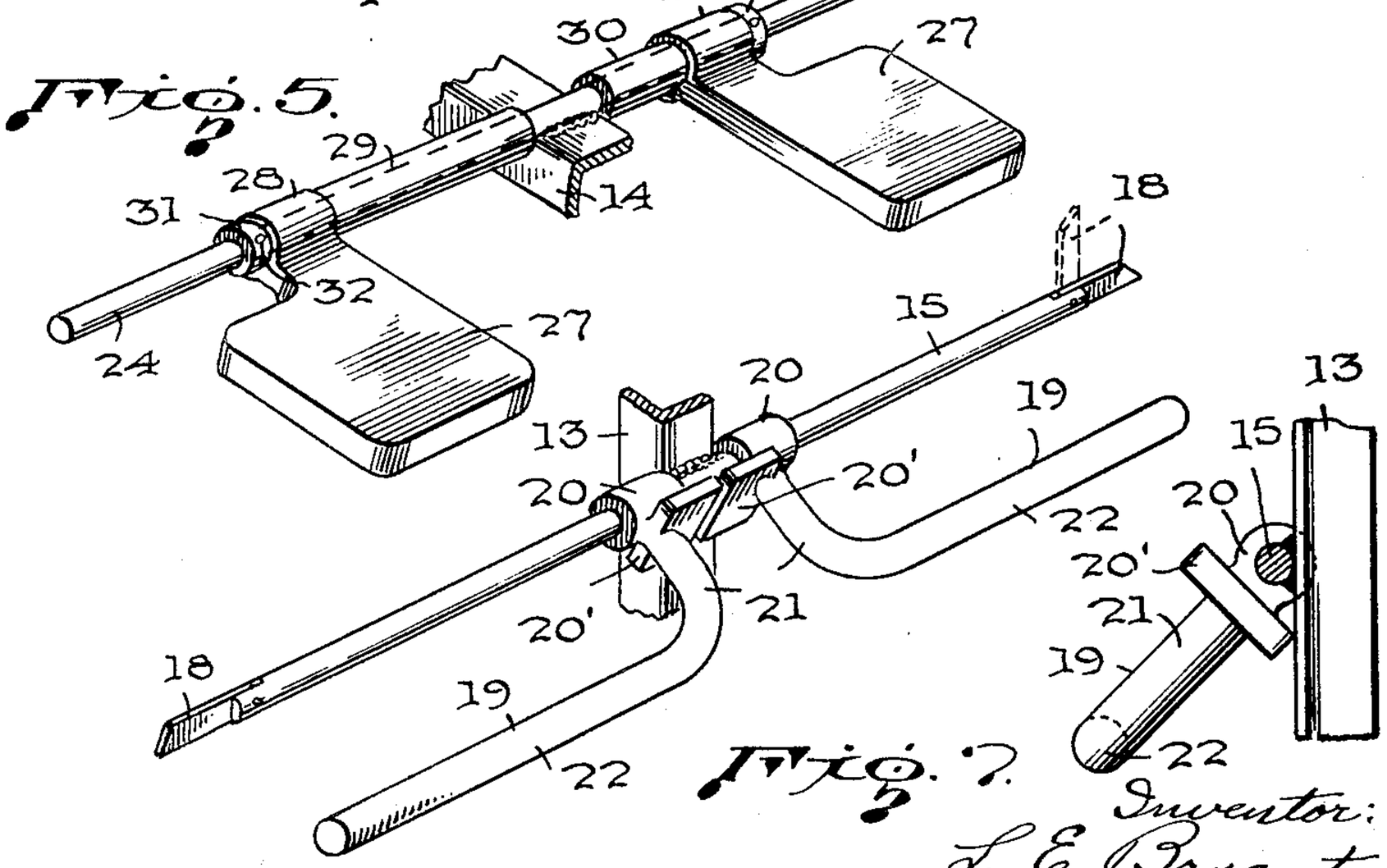

Fig. 5.

Fig. 7.

Fig. 6.

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PORTABLE LOOM CREEL AND TENSIONING MEANS THEREFOR

Original Filed July 26, 1945 3 Sheets-Sheet 2

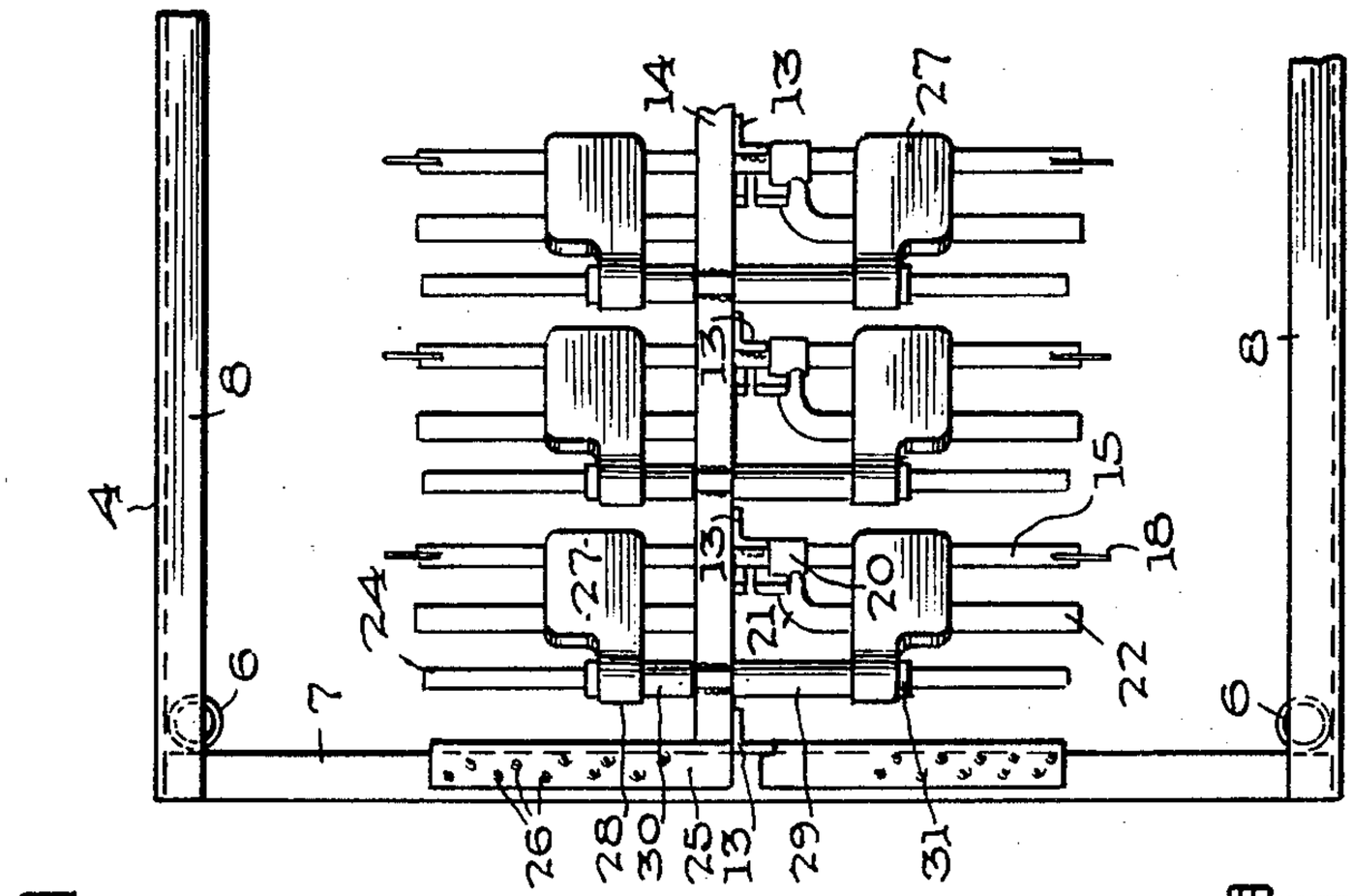

Fig. 3.

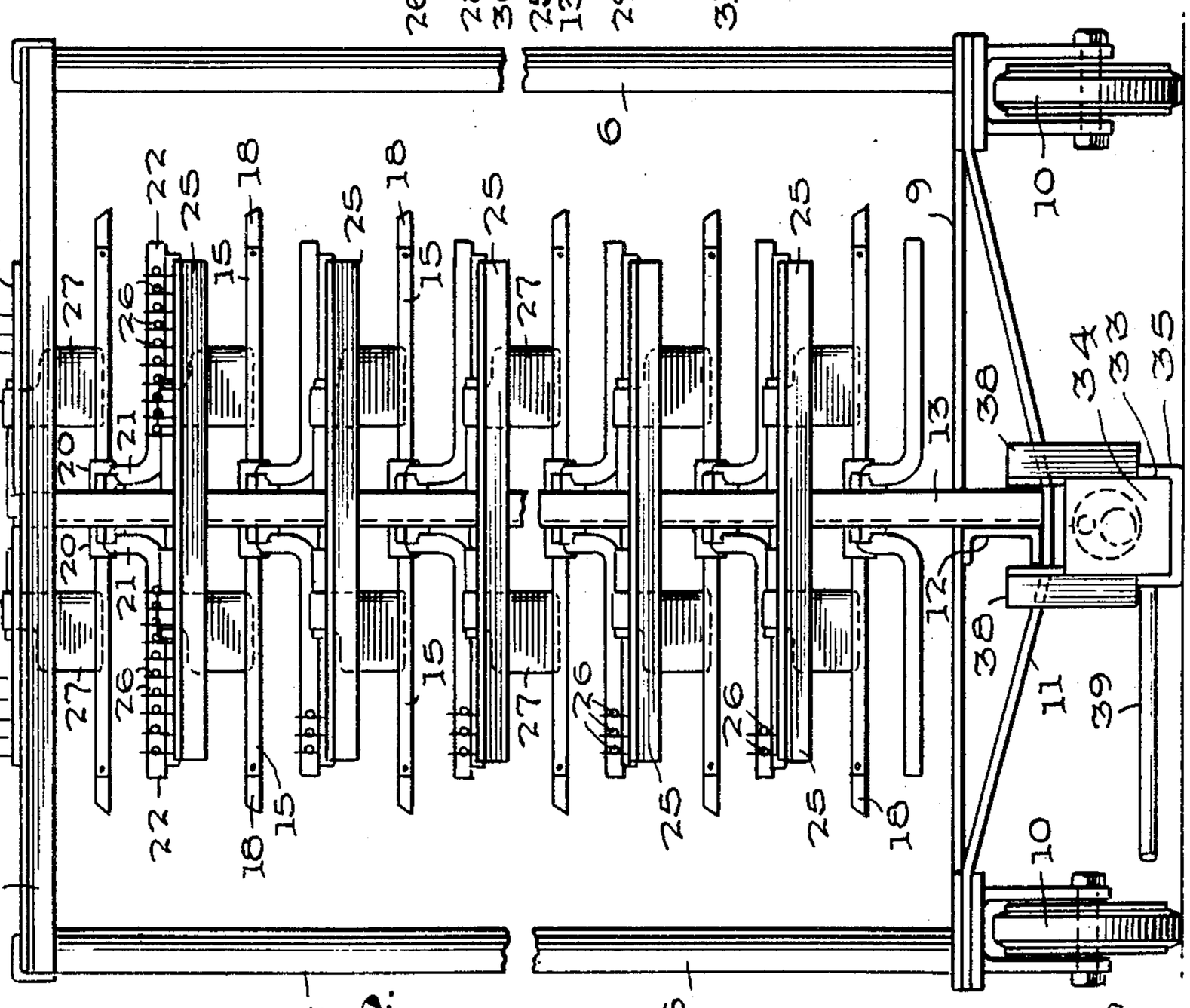

Fig. 2.

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PORTABLE LOOM CREEL AND TENSIONING MEANS THEREFOR

Original Filed July 26, 1945 3 Sheets-Sheet 3

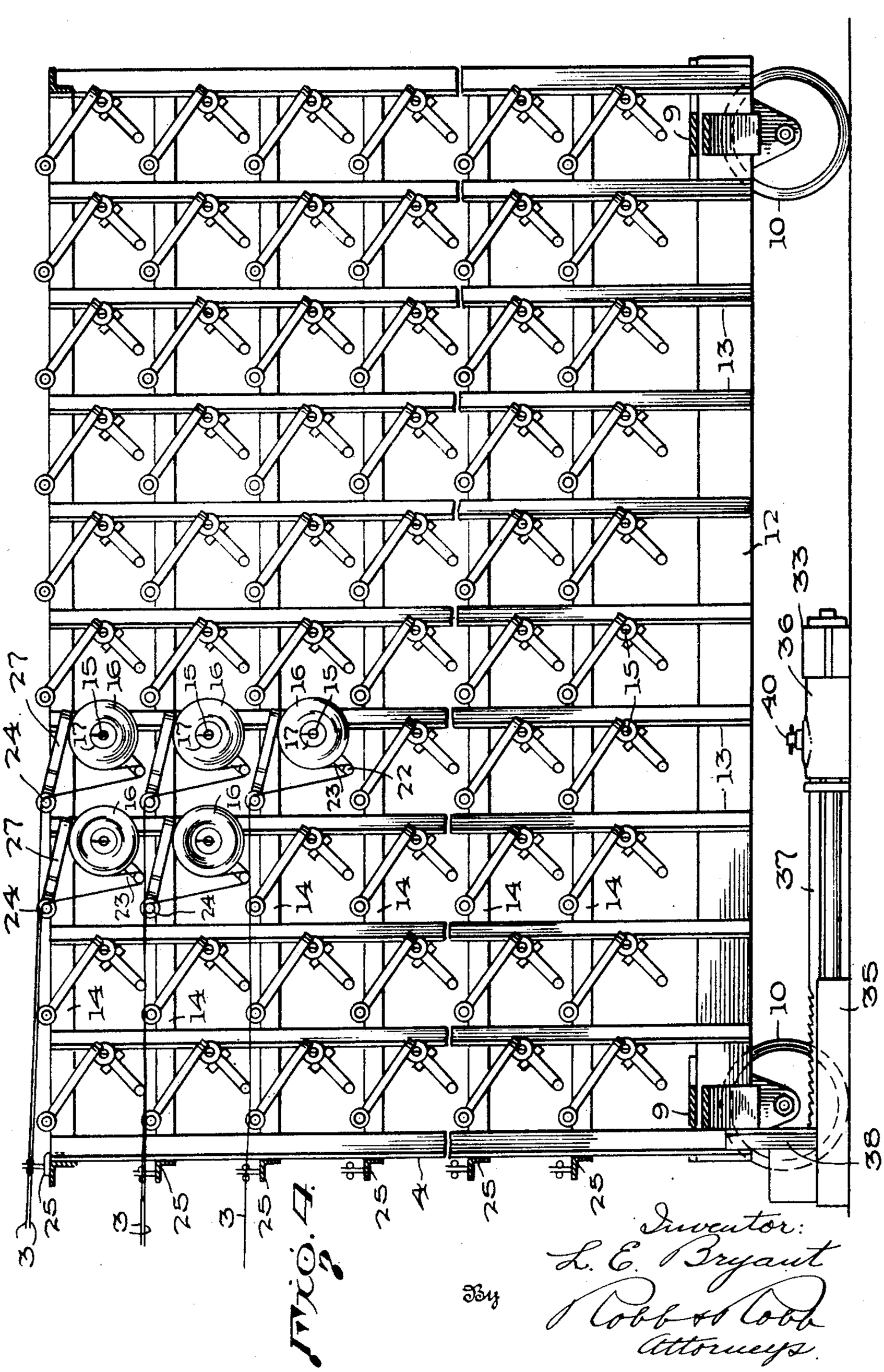

FIG. 4.

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UNITED STATES PATENT OFFICE

2,527,700

PORTABLE LOOM CREEL AND TENSIONING MEANS THEREFOR

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Original application July 26, 1945, Serial No. 609,179, now Patent No. 2,437,070, dated March 2, 1948. Divided and this application December 3, 1947, Serial No. 789,351

3 Claims. (Cl. 242—131)

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This invention appertains to loom creels, and more especially to portable loom creels for use with any type of loom where the employment of the creel method of delivering yarns to the loom is applicable in the weaving of either plain or figured fabrics. The present application is a division of my co-pending application Serial No. 607,179, filed July 26, 1945, now Patent No. 2,437,070, issued March 2, 1948.

The most common type of creel heretofore used in the weaving of rugs, carpets and similar pile fabrics, is of the stationary, flat type, having the form of a horizontal or slightly inclined frame or tray divided into a plurality of compartments, each of a size to receive a yarn spool therein. The yarn spools are disposed in the respective compartments, with the axis of each spool arranged horizontally. The spools are supported in this position by the spool heads at the opposite ends of each spool, which rest on the bottom of the respective compartments and are free to turn as the yarn is drawn from the spools into the loom. Thus, the tension on the yarns depends upon the frictional drag of the respective spool heads against the bottom of the creel frame, and this tension is usually supplemented by the use of U-shaped tension weights which are placed in an inverted position on the respective yarns so as to be freely suspended therefrom.

The spool heads have a great tendency to become warped, chipped, or otherwise irregular in shape, which invariably results in uneven tension on the yarns, and also results in a reduction of the quality of the woven fabric, as well as in the efficiency of loom operation.

In the use of these conventional stationary, flat creels, considerable time is lost in loom operation, and hence the cost of production is greatly increased, when the yarns run out so as to require replacement of the spools, and particularly, when a change of yarn color is required. In the latter case, the loom must be stopped while the operator removes the U-shaped tension weight from each yarn, cuts off the yarns, winds back by hand the extended end from each spool, removes each spool from the creel frame, replaces the spools with spools of the new yarn colors and ties the ends of the yarns to the ends in the loom, and places the tension weights back on each yarn.

The present invention has for its primary object the provision of a portable creel which can be loaded at a central preparation point and delivered to the loom, or quickly moved from one loom to another, all filled, with the yarns threaded through the tensions and guides and ready to be tied to the ends in the loom, thereby minimizing time lost in the operation of the loom.

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A further object of the invention is to provide a portable creel in which yarn packages, either on spools or on less expensive plugs, may be supported in vertical rows, one behind the other, at opposite sides of the creel so as to be readily accessible and convenient for loading and unloading, and which will accommodate yarn spools or packages of considerably greater size than heretofore used in creels of the flat type.

Another object of the invention is to provide a creel having improved tension means for the yarns, and which insures a more positive and uniform tension in each yarn.

Other and further objects and advantages of the invention will be hereinafter described and the novel features thereof defined by the appended claims.

In the drawings:

Figure 1 is a somewhat diagrammatic, fragmentary top plan view on a reduced scale, showing a plurality of portable creels constructed in accordance with the present invention, said creels serving to deliver yarns to the rear end of a loom;

Figure 2 is a view in front elevation of one of the portable loom creels;

Figure 3 is a fragmentary top plan view of the creel;

Figure 4 is a longitudinal sectional view taken through the creel, and particularly illustrating the manner in which the yarn packages are supported therein, with the yarns threaded through the tension means and guides;

Figure 5 is a detail view in perspective of a yarn package brake assembly, and further illustrating the manner of mounting said assembly on the creel frame;

Figure 6 is a perspective detail view of a yarn package and yarn tension device, and also illustrating the manner of mounting the same on the creel frame; and

Figure 7 is a detail view in side elevation of one of the yarn tension devices, with the device shown in its extreme position of rocking movement in one direction, as limited by abutting engagement with the creel frame.

Like reference characters designate corresponding parts in the several figures of the drawings, wherein 1, in Figure 1, denotes a loom of any suitable type and preferably equipped at its rear end with an open-top comb or spreader 2 for

receiving the yarns 3 delivered to the loom from one or more creels generally designated 4. From the spreader 2, the yarns may be directed over suitable guide rolls and the tension equalizing roll designated 5, as more particularly described in the application of Harold H. Fonda, Serial No. 607,227, filed July 26, 1945, now Patent No. 2,436,067, issued February 17, 1948.

The creels 4 are preferably constructed as separate portable units of predetermined width, according to the width of the loom with which the creels are to be used, and each creel is designed to handle sufficient yarns for a predetermined unit of width of the fabric. For example, rugs and carpets are commonly made in standard widths of 2′ 3″, 3′, 9′, 12′, 15′ and 18′. Therefore, each creel would be preferably constructed to handle a sufficient number of yarns for the 2′ 3″ and 3′ widths, so that for the wider widths, the number of creel units may be multiplied accordingly.

Referring to Figures 2 to 4 inclusive, it will be seen that each creel unit includes four upright corner posts, respectively designated 6, these corner posts being preferably of tubular form. Joining the top ends of the corner posts are frame members 7 extending transversely across the creel at the front and back ends respectively thereof, and the frame members 8 extending longitudinally from front to back at each side of the creel. These frame members preferably have the form of angle bars. The bottom ends of the standards or corner posts 6 are joined at the front and back ends of the creel respectively, by transversely extended base plates 9. Swivelly attached to the lower sides of the base plates 9 are wheeled casters 10, there being one caster for each corner of the creel, located below the respective corner posts 6. At the front end of the creel and extending transversely thereacross is a brace 11, said brace being inclined downwardly from the outer corners of the front base plate 9 to about the center of the creel, at which point the brace is substantially spaced below the base plate 9. Disposed between the central spaced portion of the brace 11 and the front base plate 9, and extending longitudinally from front to back of the creel frame, is a channel member 12 which serves as a rigid support to which a series of upright angle bars 13 are attached at their lower ends, one behind the other in longitudinally spaced alinement at the center of the creel. These angle bars 13 extend upwardly to the top of the creel and are joined at vertically spaced intervals by longitudinally extended, vertically spaced angle bars 14.

Attached to the forward side of each of the upright bars 13, and arranged in vertical rows, is a plurality of transversely extended spindles 15. Each spindle may be secured to the upright bar 13 by welding the same at its mid portion to the bar, so that each spindle extends transversely for a substantial distance beyond the opposite sides of the uprights 13 so that it may receive on each end thereof a yarn package 16, with the yarn wound upon either a spool, or on a plug 17. In order to prevent inadvertent displacement of the yarn packages from the spindles 15, there is preferably provided a spring-pressed, hinged latch member 18 at each end of each spindle. By swinging the latches into a horizontal position, coextensive with the spindle, the yarn packages may be slipped onto or removed from the spindles, whereas, by swinging the latches to a vertical position, the yarn packages are positively restrained against axial displacement from the spindle.

Rockably mounted on each spindle and coacting with each yarn package is a loop-forming and tension member generally designated 19, there being two of these members on each spindle, one at each side of the vertical standard 13 to which the respective spindles are attached. These loop-forming and tension members 19 each include a hub 20 loosely journaled on the spindle so as to be free to turn thereon. Extending radially from the hub 20 and integrally formed therewith is a short arm 21 from which is laterally extended a long arm 22, as best seen in Figure 6 of the drawings. The yarns 3 from the respective yarn packages are led under the arms 22 of the respective yarn looping and tension members so as to form a loop in each yarn, as indicated at 23 in Figure 4.

From the yarn looping and tension members 19, the respective yarns are directed upwardly over a guide pin 24, these guide pins being secured in any suitable manner, as by welding, to the horizontal bars 14, and extending laterally for a substantial distance to each side thereof in parallel spaced relation to the arms 22 of the respective yarn looping and tension members 19. The guide pins 24 for the respective yarn packages are located somewhat above the spindles 15 and in forwardly spaced relation to the vertical axis of the yarn package. From the guide pins 24, the yarns 3 are directed forwardly to the front end of the creel, at which end there is provided a plurality of vertically spaced angle bars 25 which are attached to the forward upright bar 13 so as to extend horizontally to opposite sides thereof. Each bar 25 is provided on its upper side with a plurality of laterally spaced eyelets or pig-tail yarn guides 26 through which the yarns 3 are extended so as to be delivered to the loom from the front end of the creel in a regularly spaced fashion.

In order to prevent excessive rotation of the yarn packages as the yarns are delivered from the creel to the loom, a brake is applied to each yarn by means of a weight having the form of a paddle designated 27, with the paddles resting upon the upper side of the respective yarn packages. Each paddle is provided with a hub portion 28 which is loosely journaled on the guide pin 24, and the paddle weights are suitably spaced on the guide pins and relative to the frame member 14 in any suitable manner, as by spacing sleeves 29 and 30 located on opposite sides of the frame members 14. With the paddle weights 27 located by the spacing sleeves 29, 30 so as to occupy positions overlying the yarn packages 16, axial displacement of the paddles is restrained in any suitable manner, as by collars 31 disposed on the guide pins 24 at the outer sides of the hubs 28, and secured to the guide pins by set screws 32, or by other suitable means of fastening, such as brazing or the like.

In the delivery of the yarns from the creel to the loom, the paddle weights 27 produce a braking action or drag upon the respective yarn packages, and as the yarn packages are used up, the paddle weights will rock on the supporting guide pins 24 so as to always exert a constant and uniform pressure against the yarn package, and create a tension in each yarn. This tension causes the loop-forming and tension member 19 to be lifted so that each arm 22 will be suspended in the respective yarn loops

23 as the yarns are taken up in the loom. Thus, the arms 22 may be said to float in the yarn loops 23, so that the weight of these arms 22 is always acting upon the yarns tending to form the loops 23, while maintaining the yarns under tension. As the yarn is taken up by the loom, the loops 23 will be progressively shortened, thereby progressively lifting the arms 22 in an upward direction, until a certain point in the yarn delivering operation is reached, which usually occurs at the completion of a cycle of the loom, whereupon the pressure of the paddle weights 27 on the yarn packages is overcome. At that time the yarn packages will unwind so as to deliver more yarn, and the arms 22 of the loop-forming and tension members 19 will automatically reform the loops 23 preliminary to another cycle of the loom operation. In forming the loops 23, the arms 22 of the respective loop-forming and tension members 19 will rock in a downward direction until their movement is limited by the abutment lugs 20' formed at the juncture of the short arms 21 and the hubs 20. These stop lugs 20' are so located as to abut against the vertical supporting standards 13, as clearly shown in Figure 7 of the drawings, in which one of the members 19 is illustrated in its normal loop-forming position.

It will be seen from reference to Figure 1 of the drawings that the creels 4 are positioned in parallel and/or tandem relation to each other at a suitable distance in back of the loom 1, and since the creels are provided with wheels or casters 10, it is necessary to anchor the creels in order to prevent them from being drawn forwardly towards the loom. To this end, I preferably employ an adjustable anchor for each creel having the form of a jack generally designated 33, said jack being suitably fastened to the floor at one end and having abutting engagement with the front end of the creel. The jack may be of any suitable type, as for example, mechanical, pneumatic, or hydraulic, although I prefer to employ a hydraulic jack which permits easier adjustment of the creels, and when the adjustment has been effected, allows the jack to be slowly restored to its initial or starting position under the influence of the pull on the yarns, and without interfering with the normal yarn tension.

According to the arrangement illustrated in the drawings, the jack has the form of a conventional hydraulic automobile bumper jack, as made by a prominent manufacturer. Instead of operating in the conventional vertical position, the jack is turned on its side so as to operate horizontally, and its base 34 is attached to the forward end of a channel member 35 which is suitably bolted to the floor at the desired distance in the rear of the loom 1. The hydraulic cylinder 36 at the opposite end of the jack rests upon the floor and is free to move thereon when the jack is operated so as to move the rack bar 37 forwardly and rearwardly. Attached to the opposite sides of the usual lift-bracket with which the jack is conventionally equipped to adjustably cooperate with the rack bar 37, is a pair of upwardly extended short angle bars 38, 38, which are disposed in vertical position and laterally spaced from each other so as to engage at their upper ends the forward edge of the front brace 11 when the creel is moved over the jack into abutting engagement with the members 38, 38, as shown in Figures 2 and 4 of the drawings. Thereafter, by manipulating the jack handle 39, the creel can be easily and quickly

forced backwards to a position which establishes the desired tension in the yarns 3, when the latter have been tied to the yarn ends in the loom. By providing a separate jack for each creel unit, the creels may be individually adjusted relative to each other in endwise relation to the loom, and the position of the jacks themselves locates the creels in proper spaced relation to each other crosswise of the loom. Longitudinal alinement of the creels relative to the loom is permitted by shifting the rear ends of the reels laterally in either direction, without disturbing the jack adjustment.

In case the jacks have been adjusted to their extreme limits rearwardly, or in any case following a rearward adjustment of the creels, especially when the yarn tensions have been restored following a release produced by an unweaving of the fabric, as sometimes is required, the release valve 40 on the hydraulic cylinder 36 of the jack may be cracked open slightly so as to allow the jack, together with the creel, to be pulled forwardly by the draw of the loom, as the weaving operation continues, thereby restoring the jack to its initial position at the forward limit of its adjustment. When the jack has been so restored, it is always ready for a subsequent adjustment of the creels rearwardly, simply by closing the valve 40 and manipulating the jack handle 39 as previously described. Through the use of the jacks, the creels are never fixed in a rigid position as in the case of conventional creels of the flat type, and thus there is provided a freedom of operation and alinement which is not inherent in the former creels.

Through the use of creels of the type of the present invention, it will be obvious that a greater flexibility of weaving to consumer specifications is accorded, since yarn colors may be more quickly changed by the substitution of creels loaded with yarns of the required colors, all ready to be tied into the loom, and without serious interruption in the operation of the loom. Moreover, fewer changes of yarn are necessary because the creels will accommodate yarn packages of as much as three times the size of the yarn packages used in former creels, and the preparation of the creels can be done by lesser skilled and lower paid employees, instead of the more highly skilled and higher paid loom operators. In the case where orders call for matching colors in several loom widths, my portable creel can be cut out from one width of loom and quickly transported and tied into another width without appreciable loss of time, and the creels may be routed to take care of several orders involving part or all of the widths covered by one order, and permit combinations to be effected so as to provide the most economical operation of the looms.

While the specific details have been herein shown and described, the invention is not confined thereto as changes and alterations may be made without departing from the spirit thereof as defined by the appended claims.

I claim:

1. In a portable loom creel, a wheeled frame having means for rotatably supporting a plurality of yarn packages, with the respective yarn packages free to rotate about a horizontal axis, and brake means for supplying a drag on the respective yarn packages to resist rotation of the latter as the yarn is drawn therefrom, said brake means each having the form of a gravity-actuated paddle weight pivotally supported on the frame at one side of and above the axis of the yarn package and

disposed to rest upon the upper side of its associated yarn package when the yarn packages are loaded in the creel, in combination with gravity-actuated loop-forming and tension members pivotally mounted on the frame and movable independently of the paddle weights aforesaid for engagement with the upper surfaces of the respective yarns at the yarn delivering sides of the yarn packages so as to freely bear downwardly with a floating action on the respective yarns and form a loop therein which will be progressively foreshortened by the draw of the loom until the drag of the paddle weight is overcome to let off more yarn from the yarn package and lengthen the loop under the gravity action of the loop-forming member.

2. In a loom creel, a frame having means for rotatably supporting a plurality of yarn packages, with the respective yarn packages free to rotate about a horizontal axis, and brake means for supplying a drag on the respective yarn packages to resist rotation of the latter as the yarn is drawn therefrom, said brake means each having the form of a gravity-actuated paddle weight pivotally supported on the frame and disposed to rest upon the upper side of its associated yarn package when the yarn packages are loaded in the creel, in combination with loop-forming and tension members disposed for engagement with the respective yarns at the yarn delivering sides of the yarn packages, said loop-forming and tension members each comprising a hub portion journaled on the axis of its yarn package for rocking movement thereabout, a radial arm extended from the hub portion, and a laterally extended yarn-engaging arm, said latter arm being adapted to lie in parallel relation to the axis of the yarn package and spaced from the periphery of the yarn package so as to rest upon the yarn with a predetermined loop-forming and yarn tensioning pressure permitting a limited feed of the yarns with consequent shortening of the yarn loops until the drag of the paddle weights is overcome to let off more yarn from the yarn packages, with consequent lengthening of the yarn loops under the influence of the loop-forming and tension members.

3. In a loom creel, a frame having means for rotatably supporting a plurality of yarn packages,

with the respective yarn packages free to rotate about a horizontal axis, and brake means for supplying a drag on the respective yarn packages to resist rotation of the latter as the yarn is drawn therefrom, said brake means each having the form of a gravity-actuated paddle weight pivotally supported on the frame and disposed to rest upon the upper side of its associated yarn package when the yarn packages are loaded in the creel, in combination with loop-forming and tension members disposed for engagement with the respective yarns at the yarn delivering sides of the yarn packages, said loop-forming and tension members each comprising a hub portion journaled on the axis of its yarn package for rocking movement thereabout, a radial arm extended from the hub portion, and a laterally extended yarn-engaging arm, said latter arm being adapted to lie in parallel relation to the axis of the yarn package and spaced from the periphery of the yarn package so as to rest upon the yarn with a predetermined loop-forming and yarn tensioning pressure, and said loop-forming and tension means each having means for limiting rocking movement thereof so as to normally assume a position with the yarn-engaging arm displaced to one side of the axis of its associated yarn package.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
389,013	Royle	Sept. 4, 1888
454,255	Connor	June 16, 1891
624,695	Smith	May 9, 1899
976,698	Ryon	Nov. 22, 1910
986,600	Sloper	Mar. 14, 1911
1,234,693	Remington	July 24, 1917
1,312,847	Hirst	Aug. 12, 1919
1,421,497	Koch et al.	July 4, 1922
2,437,070	Bryant	Mar. 2, 1948

FOREIGN PATENTS

Number	Country	Date
38,603	Austria	Aug. 25, 1909