May 22, 1945. F. LAMBACH 2,376,364

ASSEMBLY OF BEAMS AND A CONSTRUCTION FOR THE CONNECTION THEREOF WITH PARTS OF A WARP KNITTING MACHINE

Filed Nov. 1, 1943 2 Sheets-Sheet 1

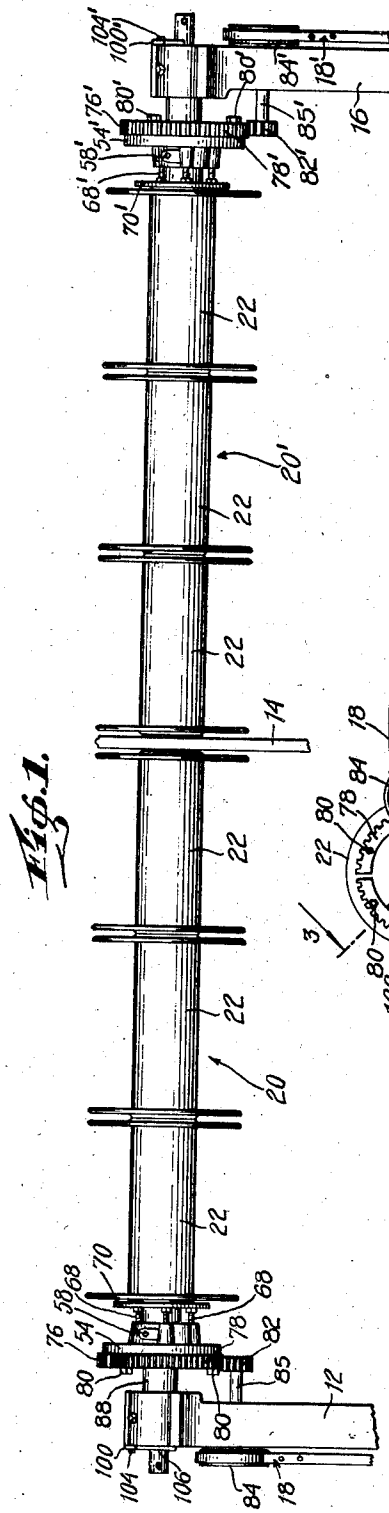


Fig. 1.

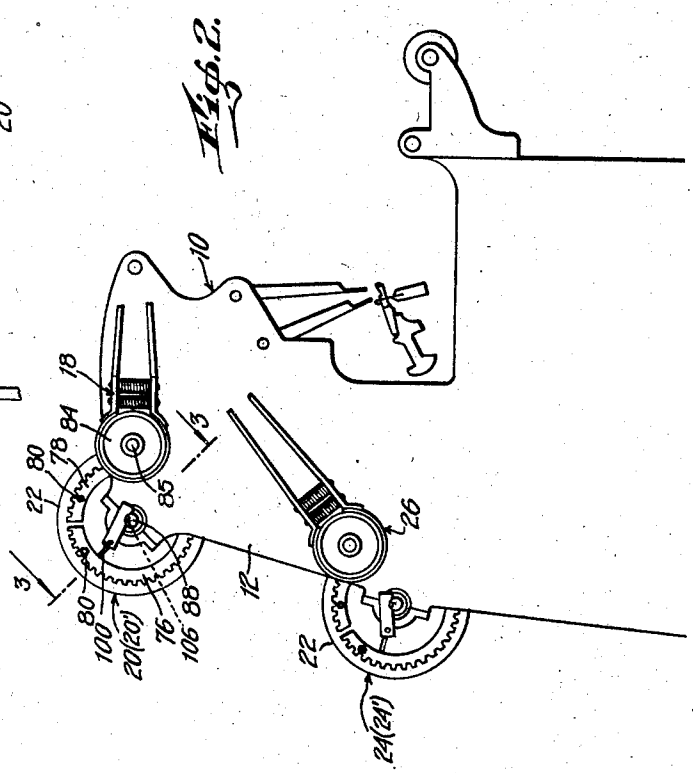


Fig. 2.

INVENTOR
FRITZ LAMBACH

BY

ATTORNEY

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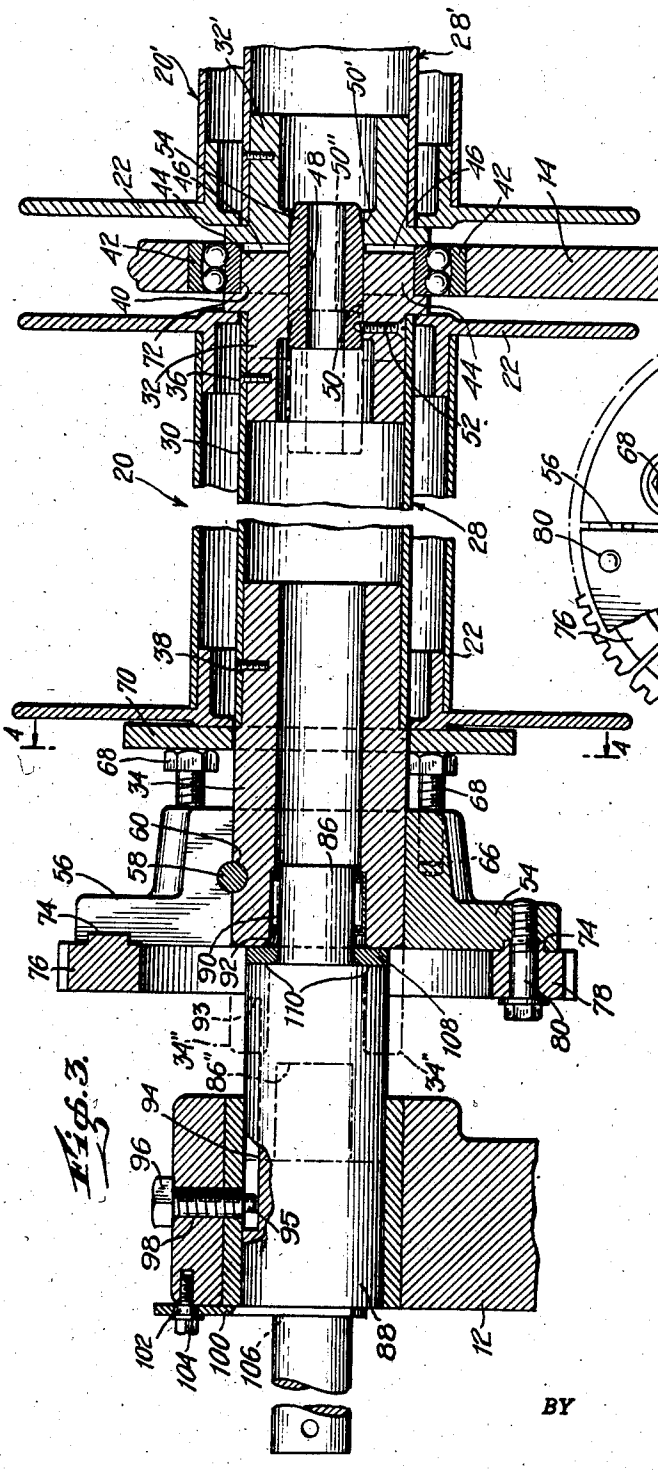


Fig. 3.

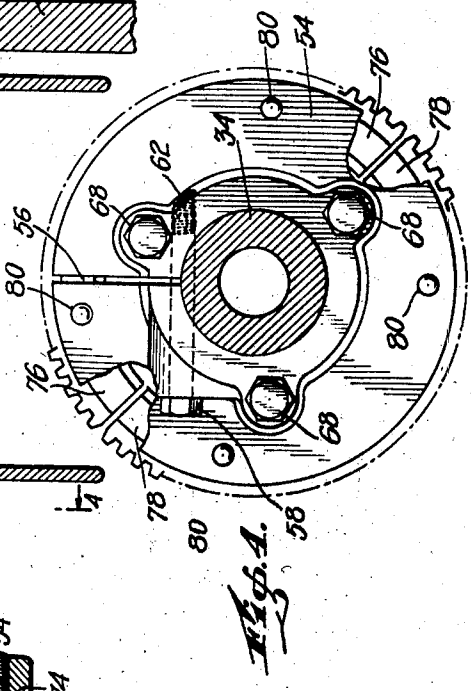


Fig. 4.

INVENTOR
FRITZ LAMBACH

BY

ATTORNEY

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ASSEMBLY OF BEAMS AND A CONSTRUCTION FOR THE CONNECTION THEREOF WITH PARTS OF A WARP KNITTING MACHINE

Fritz Lambach, Tenafly, N. J.

Application November 1, 1943, Serial No. 508,574

26 Claims. (Cl. 66—86)

My invention relates to warp knitting machines, and more particularly to the arrangement of a beam or an assembly of sectional beams in a warp knitting machine.

An object of my invention is to provide a connection of a beam or an assembly of sectional beams with parts of a warp knitting machine of such a construction, that, during the procedure of the inserting of a beam or an assembly of beams into a warp knitting machine, the beam or assembly of beams may be constantly held in a substantially horizontal position.

Another object of my invention is to improve upon the connection of the brake end of a beam or assembly of beams with the beam brake and supporting means of a warp knitting machine as now ordinarily made.

A further object of my invention is to improve upon the construction of an assembly of beams for use in a warp knitting machine as now ordinarily made.

My invention consists in certain novel features of an assembly of sectional beams and a construction for the connection of a beam or an assembly of beams with parts of a warp knitting machine as will be fully described hereinafter.

Further objects and advantages of the invention will be apparent from the following disclosure of several embodiments thereof.

In the accompanying drawings are:

Fig. 1 a top plan view of the two top assemblies of three sectional beams each carried in fragmentarily shown frame members of a warp knitting machine,

Fig. 2 is more or less diagrammatical end elevational view of the warp knitting machine with top and lower assemblies of sectional beams inserted therein,

Fig. 3, in an enlarged scale, a fragmentary sectional view of parts of the warp knitting machine and the left hand top assembly of sectional beams, taken on line 3—3 of Fig. 2, and

Fig. 4, a sectional view of the left hand top assembly of sectional beams, taken on line 4—4 of Fig. 3.

Referring now to Figs. 1 and 2, 10 generally indicates a warp knitting machine having a left hand frame end member 12, an intermediate frame member 14, and a right hand frame end member 16. 18 generally indicates a conventional beam brake mounted on the frame end member 12 for subjecting the left hand top assembly 20 of three sectional beams 22 to a certain braking action during the operation of the warp knitting machine. A corresponding beam brake 18' is arranged on the frame end member 16 for subjecting the right hand top assembly 20' of three sectional beams 22 to a certain braking action during the operation of the warp knitting machine. The two top assemblies 20 and 20' of beams 22 are arranged in alignment with each other. The warp knitting machine may also receive two similar assemblies 24 and 24' of sectional beams 22, which may be subjected to a braking action by beam brakes 26 mounted on the frame end members of the machine.

The arrangement and support of the top assemblies 20 and 20' of beams in the warp knitting machine is the same as that of the lower assemblies 24 and 24', and furthermore, the connections of the left hand assemblies 20 and 24 with parts of the warp knitting machine substantially correspond to the connections of the right hand assemblies 20' and 24' with corresponding parts of the warp knitting machine. Therefore, a detailed description of the left hand top assembly 20 of sectional beams 22 and its connections with parts of the warp knitting machine is sufficient for a full disclosure of my invention.

As best shown in Fig. 3, the set of sectional beams 22 of the assembly 20 is carried by an assembling member generally indicated by 28. Said assembling member 28 consists of a tube-like member 30, a hollow coupling member 32 and a hollow cylindrical brake end member 34. The coupling member 32 and the brake end member 34 inserted into the openings at the ends of the tube 30 are connected with the latter by screws 36 and 38.

The coupling member 32 of the assembling member 28 has a cylindrical portion 40 for engagement with a roller bearing 42 arranged in the intermediate member 14 of the frame of the warp knitting machine. Furthermore, the coupling member 32 has claws 44 for engagement with recesses 46 in a corresponding coupling member 32' of the assembling member 28' of the assembly 20' of beams 22. A cylindrical pin 48 inserted into the bore 50 of the coupling member 32 is rigidly connected with the latter by a screw 52. The projecting tapered end 54 of the pin 48 extends into the bore 50' of the coupling member 32' when the assemblies 20 and 20' of beams are mounted in the warp knitting machine.

The brake end member 34 carries at its free end a split connecting member 54 having a slot 56 as best shown in Figs. 3 and 4. The connecting member 54 is clamped on the brake end member 34 in a predetermined position by means of a screw 58, which is in engagement with a groove

60 of the brake end member 34 and is threaded into a threaded bore 62 of the connecting member 54. The connecting member 54 is provided with three threaded bores 66 at its side facing the set of beams 22. Adjustable setting screws 68 are threaded into said three bores 66. A ring 70 is loosely arranged on the brake end member 34 between the heads of said setting screws 68 and the first beam 22 of the set of beams. The setting screws 68 may be adjusted in such a position that they contact the ring 70 and urge the set of beams through the medium of said ring 70 against a flange 72 arranged on the coupling member 32. Thus, the set of beams may be frictionally connected with the assembling member 28 for a rotation thereof when the beams 22 are rotated by the yarn drawn off from the beams during the operation of the knitting machine. The above described connection of the set of beams with the assembling member 28 takes care of slight differences in the width of the beams, the connecting member 54 is always in the same position on the brake end member 34 of the assembling member 28. The connecting member 54 is provided with an annular groove 74 for the reception of two gear segments 76 and 78 at its side facing the frame end member 12. The gear segments 76 and 78 may be attached to the connecting member 54 by means of screws 80. As best shown in Fig. 1, said gear segments 76 and 78 are arranged for meshing engagement with a pinion 82 connected with a drum 84 of the beam brake 18 through a shaft 85 journalled in a suitable bearing mounted on the frame end member 12.

As best shown in Fig. 3 a journal 86 forming a part of a slidable cylindrical supporting member 88 may be engaged with a needle bearing 90 mounted in the opening 92 at the end of the hollow brake end member 34. The slidable supporting member 88 is in the shape of a rod having a groove 94 for engagement with the end 95 of a screw 96 threaded into a threaded bore 98 of the frame end member 12. Therefore, the supporting member 88 may be displaced in the direction of its longitudinal axis, but it cannot participate in the rotation of the assembling member 28. A safety latch 100 is swingably mounted on a cylindrical shoulder 102 of a screw 104 threaded into a threaded bore of the frame end member 12. When the slidable supporting member 88 is in the position for engagement with the brake end member 34 of the assembly 20 of the beams 22, the swingable safety latch may be brought into engagement with a recess 106 on the member 88 for holding same in its position, as shown in Fig. 3.

In order to make the assembly 20 of beams ready for use, the connecting member 54 and the ring 70 are removed from the assembling member 28. Now, the set of sectional beams 22 may be arranged on the assembling member 28 by shifting same over the brake end member 34 towards the flanged coupling member 32. Then, the ring 70 is arranged on the assembling member 28 and placed against the head of the first beam 22, whereupon the connecting member 54 without the gear segments 76 and 78 attached thereto is secured to the brake end member 34 by means of the screw 58. Now, the setting screws 68 are brought into engagement with the ring 70 so as to urge the set of beams against the flange 72 of the coupling member 32. The assembly 20 of beams thus prepared may be inserted into the warp knitting machine in the following manner:

After a disengagement of the safety latch 100 from the recess 106 by swinging same around the shoulder 102 of the screw 104, the shiftable supporting member 88 is moved in left hand direction as viewed in Fig. 3, until the end 93 of the groove 94 abuts against the projecting end 95 of the screw 96 and the end of the journal 86 is in the position 86'' shown in dash and dot lines. As may be gathered from Fig. 3, the distance between the end of the journal 86 in the position 86'' and the intermediate frame member 14 is larger than the distance between the end of the brake end member 34 and the projecting end of the pin 50. Therefore, the assembly 20 of beams 22 may be readily lowered with its longitudinal axis in a substantially horizontal position for an insertion into the warp knitting maching. As soon as the assembly 20 of beams 22 reaches the position indicated by the dash and dot lines 34'' and 50'', the lowering of the assembly will be stopped. Thereupon, the assembly 20 of beams is shifted in right hand direction as viewed in Fig. 3 for engagement of its coupling member 32 with the roller bearing 42 and for engagement of the coupling member 32 with the coupling member 32' of the assembly 20' if the latter has been inserted first. Now, the shiftable supporting member 88 is moved in right hand direction, until the collar bearing 108 mounted on its shoulder 110 abuts against the end of the brake end member 34 as shown in full lines in Fig. 3. As soon as the supporting member 88 reaches said position, the swingable latch 100 resting on the surface of the member 88 drops by gravity into the recess 106, so that it holds the supporting member 88 in its engaging position.

After the insertion of the assembly 20 of sectional beams 22 into the warp knitting machine as described above, the brake end member 34 of the assembly 20 is connected with the beam brake 18 by attaching the gear segments 76 and 78 to the connecting member 54 by means of the screws 80.

For a removal of the assembly 20 of beams 22 from the warp knitting machine the above described steps are carried out in reversed sequence.

In the drawings each assembly of beams comprises three sectional beams. Of course, the assemblies of beams may be composed of any other suitable number of sectional beams.

Furthermore, a single beam instead of an assembly of several beams may also be connected with the parts of the warp knitting machine according to above described principles of my invention.

According to the drawings the gear segments 76 and 78 for an operative engagement of the assembly of beams with the beam brake are attached to the connecting member 54. If desired, the gear segments 76 and 78 could be secured to the assembly of beams in a different manner, for example they could be secured directly to the assembling member, if a different type of means for connecting the set of beams with the assembling member is used. Moreover, the gear segments 76 and 78 may be replaced by other means for coupling the assembly of beams with the beam brake.

My invention is not restricted to the combination of parts shown in the drawings. For example, the connecting means 54, 68 may be applied to an assembly of beams for use in a warp knitting machine which is not equipped with an axially slidable supporting member 86, 88 for the

support of the assembly of beams, or else, a warp knitting machine may be equipped with axially slidable supporting means **86**, **88** for the support of a beam or an assembly of beams having a different type of connection with a beam brake than shown in the drawings.

I have described preferred embodiments of my invention, but it is clear that numerous changes and omissions may be made without departing from the spirit of my invention.

What I claim is:

1. An assembly of beams for use in a warp knitting machine having a beam brake including a rotatable shaft carrying the drum of the beam brake and a coupling member, said assembly of beams, comprising: an assembling member carrying a set of beams, and coupling means mounted on the assembling member for operative engagement with the coupling member of the beam brake.

2. An assembly of beams for use in a warp knitting machine having a beam brake the drum of which is connected with a pinion, comprising: an assembling member carrying a set of beams, and a gear mounted on the assembling member for operative engagement with the pinion of the beam brake.

3. An assembly of beams for use in a warp knitting machine having a beam brake the drum of which is connected with a pinion, comprising: an assembling member carrying a set of beams, and a plurality of gear segments mounted on the assembling member for operative engagement with the pinion of the beam brake.

4. An assembly of beams for use in a warp knitting machine having a beam brake, comprising: an assembling member carrying a set of beams, said assembling member having a flange at one of its ends, adjustable connecting means mounted at the other end of the assembling member for urging the set of beams against said flange, and coupling means mounted on said connecting means for operative engagement with the beam brake.

5. An assembly of beams for use in a warp knitting machine having a beam brake the drum of which is connected with a pinion, comprising: an assembling member carrying a set of beams, said assembling member having a flange at one of its ends, a connecting member secured to the other end of the assembling member, adjustable setting means arranged on said connecting member for urging the set of beams against said flange, and a plurality of gear segments mounted on said connecting member for operative engagement with the pinion of the beam brake.

6. An assembly of beams for use in a warp knitting machine having a beam brake the drum of which is connected with a pinion, comprising: an assembling member carrying a set of beams, said assembling member having a flange at one of its ends, a split connecting member, means for clamping said split connecting member in a preedtermined position on the other end of the assembling member, adjustable setting means arranged on said connecting member for urging the set of beams against said flange, and a plurality of gear segments mounted on said connecting member for operative engagement with the pinion of the beam brake.

7. An assembly of beams for use in a warp knitting machine having a beam brake the drum of which is connected with a pinion, comprising: an assembling member carrying a set of beams, said assembling member having a flange at one of its ends and having a groove at its other end, a split connecting member arranged on said other end of the assembling member, a clamping means associated with said split connecting member for clamping same on said other end of the assembling member, said clamping means being in engagement with said groove so as to hold said split connecting member in a predetermined position on the assembling member, adjustable setting means arranged on said connecting member for urging the set of beams against said flange, and a plurality of gear segments mounted on said connecting member for operative engagement with the pinion of the beam brake.

8. An assembly of beams for use in a warp knitting machine, comprising: an assembling member carrying a set of beams, said assembling member having a flange at one of its ends, a connecting member secured to the other end of the assembling member, and adjustable setting means arranged on said connecting member for urging the set of beams against said flange.

9. An assembly of beams for use in a warp knitting machine, comprising: an assembling member carrying a set of beams, said assembling member having a flange at one of its ends, a connecting member secured to the other end of the assembling member, said connecting member having threaded bores at one of its sides, and adjustable setting screws engaged with said threaded bores, said adjustable setting screws being arranged for urging the set of beams against said flange.

10. An assembly of beams for use in a warp knitting machine, comprising: an assembling member carrying a set of beams, said assembling member having a flange at one of its ends, a split connecting member, means for clamping said split connecting member in a predetermined position on the other end of the assembling member, and adjustable setting means arranged on said connecting member for urging the set of beams against said flange.

11. An assembly of beams for use in a warp knitting machine, comprising: an assembling member carrying a set of beams, said assembling member having a flange at one of its ends and having a groove at its other end, a split connecting member arranged on said other end of the assembling member, a clamping means associated with said split connecting member for clamping same on said other end of the assembling member, said clamping means being in engagement with said groove so as to hold said split connecting member in a predetermined position on the assembling member, and adjustable setting means arranged on said split connecting member for urging the set of beams against said flange.

12. An assembly of beams for use in a warp knitting machine, comprising: an assembling member carrying a set of beams, said assembling member having a flange at one of its ends, a split connecting member, means for clamping said split connecting member in a predetermined position on the other end of the assembling member, said connecting member having threaded bores at one of its sides, and adjustable setting screws engaged with said threaded bores, said adjustable setting screws being arranged for urging the set of beams against said flange.

13. A construction for the connection of the brake end of a beam or assembly of beams with parts of a warp knitting machine having a beam brake, comprising: a supporting means slidably

mounted in a stationary part of the warp knitting machine, said supporting means being arranged for engagement with the brake end of the beam or beam assembly in one of its extreme positions and for disengagement from said brake end in its other extreme position, and coupling means mounted on the brake end of the beam or beam assembly for an operative engagement with the beam brake.

14. A construction for the connection of the brake end of a beam or assembly of beams with parts of a warp knitting machine having a beam brake, comprising: a supporting means slidably mounted in a stationary part of the warp knitting machine, said supporting means being arranged for engagement with the brake end of the beam or beam assembly in one of its extreme positions and for disengagement from said brake end in its other extreme position, and coupling means detachably mounted on the brake end of the beam or beam assembly for an operative engagement with the beam brake.

15. A construction for the connection of the brake end of a beam or assembly of beams with parts of a warp knitting machine having a beam brake, comprising: a supporting means slidably mounted in a stationary part of the warp knitting machine, said supporting means being arranged for engagement with the brake end of the beam or beam assembly in one of its extreme positions and for disengagement from said brake end in its other extreme position, safety means arranged for holding the slidable supporting means in its position for engagement with said brake end of the beam or beam assembly, and coupling means mounted on the brake end of the beam or beam assembly for an operative engagement with the beam brake.

16. A construction for the connection of the brake end of a beam or assembly of beams with parts of a warp knitting machine having a beam brake, comprising: a supporting means slidably mounted in a stationary part of the warp knitting machine, said supporting means being arranged for engagement with the brake end of the beam or beam assembly in one of its extreme positions and for disengagement from said brake end in its other extreme position, said supporting means having a recess, a safety latch swingably mounted on a stationary part of the warp knitting machine, said safety latch being capable of engaging said recess when the slidable supporting means is in position for engagement with said brake end of the beam or beam assembly so as to hold said supporting means in said engaging position, and coupling means mounted on the brake end of the beam or beam assembly for an operative engagement with the beam brake.

17. A construction for the connection of the brake end of a beam or assembly of beams with parts of a warp knitting machine having a beam brake the drum of which is connected with a pinion, comprising: a supporting means slidably mounted in a stationary part of the warp knitting machine, said supporting means being arranged for engagement with the brake end of the beam or beam assembly in one of its extreme positions and for disengagement from said brake end in its other extreme position, and a plurality of gear segments detachably mounted on the brake end of the beam or beam assembly for an operative engagement with the pinion of the beam brake.

18. In a construction for the connection of the brake end of an assembly of beams with parts of a warp knitting machine having a beam brake, said assembly of beams including an assembling member carrying a set of beams, the combination of: a supporting means slidably mounted in a stationary part of the warp knitting machine, said supporting means being arranged for engagement with the brake end of the assembling member in one of its extreme positions and for disengagement from said brake end of the assembling member in its other extreme position, connecting means mounted on the brake end of the assembling member for connecting the set of beams with the latter, and coupling means attached to said connecting means for an operative engagement with the beam brake.

19. In a construction for the connection of the brake end of an assembly of beams with parts of a warp knitting machine having a beam brake, said assembly of beams including a flanged assembling member carrying a set of beams, the combination of: a supporting means slidably mounted in a stationary part of the warp knitting machine, said supporting means being arranged for engagement with the brake end of the assembling member in one of its extreme positions and for disengagement from said brake end of the assembling member in its other extreme position, adjustable connecting means mounted on the brake end of the assembling member for urging the set of beams against the flange of the assembling member, and coupling means attached to said connecting means for an operative engagement with the beam brake.

20. In a construction for the connection of the brake end of an assembly of beams with parts of a warp knitting machine having a beam brake, said assembly of beams including a flanged assembling member carrying a set of beams, the combination of: a supporting means slidably mounted in a stationary part of the warp knitting machine, said supporting means being arranged for engagement with the brake end of the assembling member in one of its extreme positions and for disengagement from said brake end of the assembling member in its other extreme position, a connecting member secured to the brake end of the assembling member, adjustable setting means arranged on said connecting member for urging the set of beams against the flange of the assembly member, and coupling means attached to said connecting member for an operative engagement with the beam brake.

21. In a construction for the connection of the brake end of an assembly of beams with parts of a warp knitting machine having a beam brake, said assembly of beams including an assembling member carrying a set of beams, the combination of: a supporting means slidably mounted in a stationary part of the warp knitting machine, said supporting means being arranged for engagement with the brake end of the assembling member in one of its extreme positions and for disengagement from said brake end of the assembling member in its other extreme position, safety means arranged for holding the slidable supporting means in its position for engagement with said brake end of the assembling member, connecting means mounted on the brake end of the assembling member for connecting the set of beams with the latter, and coupling means attached to said connecting means for an operative engagement with the beam brake.

22. In a construction for the connection of the brake end of an assembly of beams with parts of a warp knitting machine having a beam brake

the drum of which is connected with a pinion, said assembly of beams including an assembling member carrying a set of beams, the combination of: a supporting means slidably mounted in a stationary part of the warp knitting machine, said supporting means being arranged for engagement with the brake end of the assembling member in one of its extreme positions and for disengagement from said brake end of the assembling member in its other extreme position, connecting means on the brake end of the assembling member for connecting the set of beams with the latter, and a plurality of gear segments detachably mounted on said connecting means for an operative engagement with the pinion of the beam brake.

23. In a construction for the connection of the brake end of an assembly of beams with parts of a warp knitting machine having a beam brake the drum of which is connected with a pinion, said assembly of beams including a flanged assembling member carrying a set of beams, the combination of: a supporting means slidably mounted in a stationary part of the warp knitting machine, said supporting means being arranged for engagement with the brake end of the assembling member in one of its extreme positions and for disengagement from said brake end of the assembling member in its other extreme position, adjustable connecting means mounted on the brake end of the assembling member for urging the set of beams against the flange of the assembling member, and a plurality of gear segments detachably mounted on said adjustable connecting means for an operative engagement with the pinion of the beam brake.

24. In a construction for the connection of the brake end of an assembly of beams with parts of a warp knitting machine having a beam brake the drum of which is connected with a pinion, said assembly of beams including a flanged assembling member carrying a set of beams, the combination of: a supporting means slidably mounted in a stationary part of the warp knitting machine, said supporting means being arranged for engagement with the brake end of the assembling member in one of its extreme positions and for disengagement from said brake end of the assembling member in its other extreme position, a connecting member secured to the brake end of the assembling member, adjustable setting means arranged on said connecting member for urging the set of beams against the flange of the assembling member, and a plurality of gear segments detachably mounted on said connecting member for an operative engagement with the pinion of the beam brake.

25. In a construction for the connection of the brake end of an assembly of beams with parts of a warp knitting machine having a beam brake the drum of which is connected with a pinion, said assembly of beams including an assembling member carrying a set of beams, the combination of: a supporting means slidably mounted in a stationary part of the warp knitting machine, said supporting means being arranged for engagement with the brake end of the assembling member in one of its extreme positions and for disengagement from said brake end of the assembling member in its other extreme position, safety means arranged for holding the slidable supporting means in its position for engagement with said brake end of the assembling member, connecting means mounted on the brake end of the assembling member for connecting the set of beams with the latter, and a plurality of gear segments detachably mounted on said connecting means for an operative engagement with the pinion of the beam brake.

26. In a construction for the connection of the brake end of an assembly of beams with parts of a warp knitting machine having a beam brake the drum of which is connected with a pinion, said assembly of beams including a hollow flanged assembling member carrying a set of beams, the combination of: a journal axially movably mounted in a stationary part of the warp knitting machine, said journal being arranged for engagement with the opening at the brake end of the hollow assembling member in one of its extreme positions and for disengagement from said opening in its other extreme position, safety means arranged for holding the axially movable journal in its position for engagement with said opening, a connecting member secured to the brake end of the assembling member, adjustable setting means arranged on said connecting member for urging the set of beams against the flange of the assembling member, and a plurality of gear segments detachably mounted on said connecting member for an operative engagement with the pinion of the beam brake.

FRITZ LAMBACH.