

Jan. 3, 1950

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2,493,631

PICK SHAFT ASSEMBLY

Filed May 4, 1948

Fig. 1

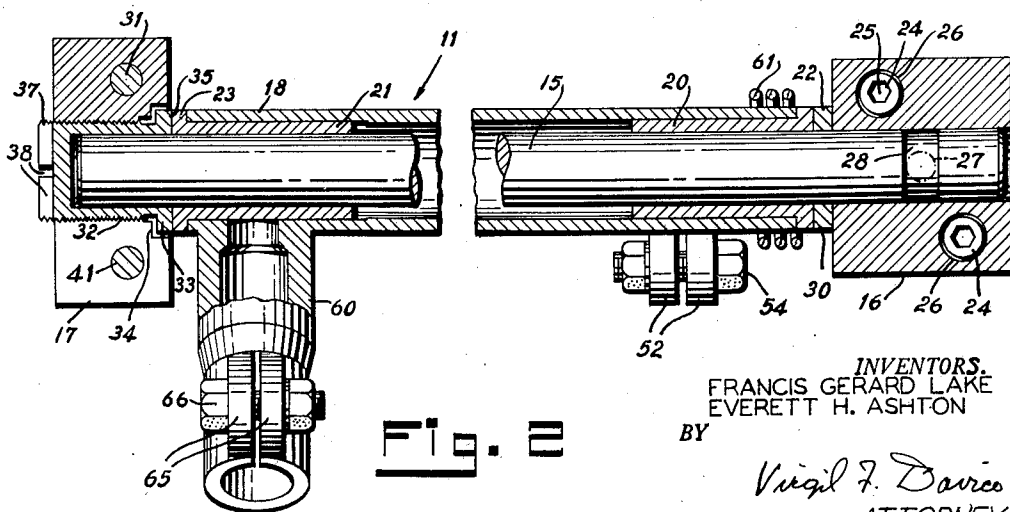
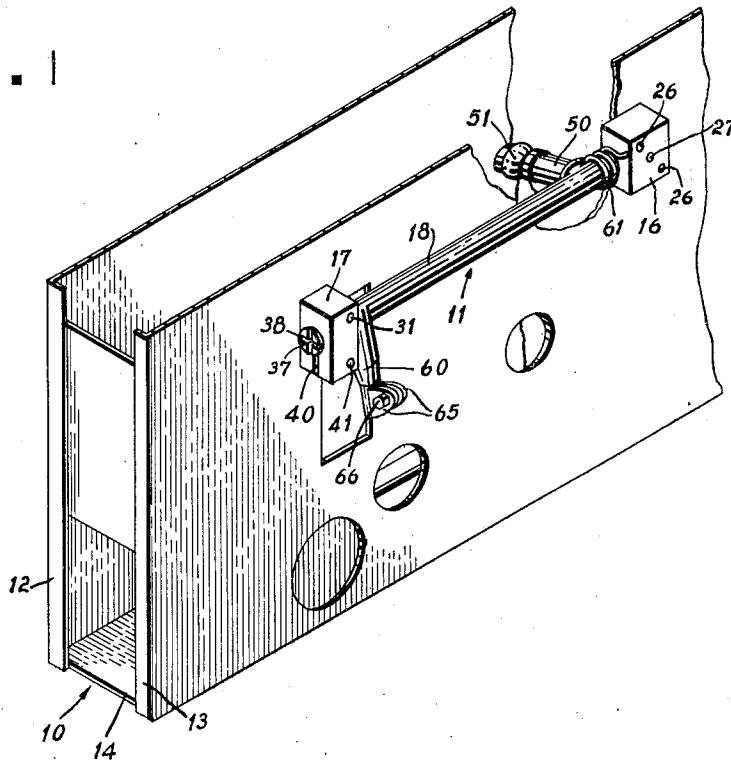


Fig. 2

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2,493,631

PICK SHAFT ASSEMBLY

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Application May 4, 1948; Serial No. 25,028

9 Claims. (Cl. 139-147)

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The present invention relates to pick shaft assemblies for looms of the fly shuttle type.

In one type of pick motion, there is provided a pick shaft supported for rocking rotation in bearings mounted on a loomside and having near one end a crank arm with a cam follower engaging a pick cam and near the other end a crank arm with a lug stick and a lug strap connection to a picker stick. As the projecting part or nose of the pick cam revolves, it strikes the cam follower and forces it upwardly. This in turn throws the crank arm nearest the picker stick inward and thereby draws the picker stick towards the loom. The picker stick, by means of the force with which it is drawn in, delivers a blow to the shuttle sufficient to send it across the loom and into the opposite box. After the shuttle has entered the opposite box, a pick motion of exactly the same construction will then throw it back again across the loom.

One object of the present invention is to provide a new and improved pick shaft assembly which is designed and constructed to eliminate need for accurate alignment of the shaft mounting brackets thereof.

Another object is to provide a new and improved pick shaft assembly having a pick shaft adjustable to eliminate end play therein caused by wear resulting from the thrust forces on said shaft incident to picking action.

A further object is to provide a new and improved pick shaft assembly provided with spring control for the cam follower to bias said follower against the active surface of the pick cam.

Another object is to provide a new and improved pick shaft assembly of unit design to afford ease of assembly.

A still further object is to provide a new and improved pick shaft assembly affording better bearing design and permitting thereby the pick shaft to be of shorter length.

Various other objects of the invention are apparent from the following particular description and from an inspection of the accompanying drawings, in which:

Fig. 1 is a fragmentary perspective of the right-hand loomside showing a pick shaft assembly embodying the present invention; and

Fig. 2 is a longitudinal section of the pick shaft assembly.

Referring to the drawings, there is shown only the right-hand loomside 10 supporting the pick shaft assembly 11 of the present invention but it must be understood that the pick shaft assembly on the left-hand loomside is similar in construc-

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tion. The loomside may be of the conventional single frame plate type or may be of the improved type shown in copending application Serial No. 691,237, filed August 17, 1946, in which each loomside comprises a pair of parallel upright webs 12 and 13 as shown, suitably braced and interconnected at the bottom by a base plate 14.

The pick shaft assembly 11 comprises a horizontal bearing rod 15, the ends of which are supported in respective mounting brackets 16 and 17 secured to the outer frame plate 13. Concentrically encircling the bearing rod 15 is a tubular pick shaft 18 having at its ends respective bushings 20 and 21 press-fitted into or otherwise secured to said shaft for rotation therewith and embracing the rod 15 with bearing rotative fits. The bushings 20 and 21 are provided with outer end flanges 22 and 23 respectively, bearing against the corresponding ends of the pick shaft 18.

The bracket 16 is in the form of a block and is removably secured to the outer frame plate 13 by screw studs 24 threaded into nuts (not shown) affixed to the inner face of said frame plate and having respective heads 25. The stud heads extend within stud holes 26 and are hexagonally shaped to receive a suitable turning tool such as a wrench. A set screw 27 in the mounting bracket 16 bearing on a diametrically reduced section 28 of the bearing rod 15 holds said rod against rotation. A ring 30 on the bearing rod 15 spaces the pick shaft 18 from the mounting bracket 16.

The bracket 17 for mounting the other end of the pick shaft 18 is also substantially in the form of a block and is removably secured to the outer frame plate 13 by a screw stud 31 in a manner similar to that described in connection with studs 24. The bracket 17 has mounted therein a thrust bearing 32 for the pick shaft 18. The thrust bearing 32 is adjustable to take up wear resulting from the end thrust on the pick shaft 18. For that purpose, the thrust bearing 32 is in the shape of a cup externally threaded for screw engagement with the bracket 17 and embraces the end of the bearing rod 15 with a snug slide fit. A flange 33 at one end of the thrust bearing 32 extends at least partially into a recess 34 on one side of the mounting bracket 17 and presents a flat bearing surface 35 against which the flange 23 of the bushings 21 is thrust. At the other end, the thrust bearing 32 has a head 37 projecting outwardly from the mounting bracket 17 and shaped to receive a suitable turning tool. For that purpose, the bearing head is shown with cross-slots 38 into which a turning tool in the form of a screw-driver may extend.

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To lock the thrust bearing 32 in adjusted position, the mounting bracket 17 is in the form of a clamp having a slit 40 on one side of said thrust bearing. A stud 41 passes through the cloven sections of bracket 17 and is threaded into a nut (not shown) affixed to the frame plate 13. By turning the stud 41 in the proper direction, the hold on the thrust bearing 32 may be released sufficiently to permit said thrust bearing to be rotated for adjustment. After the thrust bearing 32 has been turned into the desired adjusted position, it is set in this position by turning the stud 41 in the proper direction to increase the clamping action of the bracket 17.

The tubular shaft 18 has integral therewith near one end, a tubular crank arm 50 passing substantially horizontally through an opening in the frame plate 13 and carrying at its outer end a pick cam follower 51. The cam follower is shown in the form of a roller engaging the pick cam (not shown) and provided with a periphery having a convex profile in an axial direction. The cam follower 51 is supported on an axle threaded into the crank arm 50 and the crank arm is longitudinally split and has on opposite sides of its split a pair of opposed flanges 52 through which a bolt 54 passes. Through the bolt 54 the axle supporting the cam follower 51 may be locked in any position of adjustment of the cam follower with respect to the pick cam.

Near the other end, the tubular shaft 18 has integral therewith a tubular crank arm 60 depending therefrom. The crank arm 60 is longitudinally split and has on opposite sides a pair of opposed flanges 65 through which bolt 66 passes. A member (not shown) is adapted to slide within arm 60 to connect arm 60 to a lug stick and a lug strap (not shown) or any other suitable connection with the picker stick (not shown). Bolt 66 may be locked in any position of adjustment of the slidable member with respect to the picker stick.

A coil spring 61 encircling the pick shaft 18 between the crank arm 50 and the mounting bracket 16 has one end anchored to said mounting bracket and the other end secured to said shaft and biases said shaft rotatively in a direction to urge the cam follower 51 against the pick cam.

In the operation of the pick motion, as the toe or projecting part of the pick cam rides in engagement with the cam follower 51, it rotates the pick shaft 18 at highly accelerated speed through the crank arm 50 carrying said cam follower. This moves the other crank arm 60 inwardly towards the loomside and causes the picker stick to hurl the shuttle across the loom.

It should be noted that in mounting the pick shaft 18 in position, no accurate aligning of the brackets 16 and 17 is required, since the rod 15 acts as a bearing for said shaft and its inherent axial straight line integral structure assures proper aligning of the bearing supports at both ends of said shaft.

The reactions of the pick cam on the pick shaft 18 are such as to urge said pick shaft normally towards the left (Fig. 2), so that the flange 23 bears against the flange 33. As either or both of these flanges wear out, the thrust bearing 32 is adjusted, as already described, to take up this wear. It is seen therefore, that by this arrangement, the position of the crank arm 50 remains constant, regardless of wear. This is important, since it is necessary that the position of the cam follower 51 with respect to the pick cam be not

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affected by wear in the thrust surfaces. The position of the crank arm 60 also is unaffected by the wear of the thrust surfaces of flanges 23 and 33.

It should be noted that the entire pick shaft assembly 11 including the pick shaft 18, the bearing rod 15, the thrust bearing 32 and the mounting brackets 16 and 17 may all be connected together in a single unit, and the unit then mounted as such on to the frame plate 13, simply by screwing the studs 24, 31 and 41 in position. No alignment of bearings is necessary.

Also, it should be noted, that since the bearing supports for the pick shaft 18 are inside said shaft, the length of said shaft can be made materially less than is possible with outside bearing supports such as those in conventional pick shaft assemblies.

While the invention has been described with particular reference to a specific embodiment, it is to be understood that it is not to be limited thereto but is to be construed broadly and restricted solely by the scope of the appended claims.

What is claimed is:

1. In a pick shaft assembly for a loom, the combination comprising a bearing rod, bracket means for supporting the ends of said bearing rod against rotation and endwise movement and adapted to be mounted on a loomside, and a tubular pick shaft encircling said bearing rod and spaced therefrom and means supported on said bearing rod for rotation relative thereto spacing said pick shaft from said bearing rod and engaging said pick shaft for rotation therewith, said pick shaft having a crank arm for a pick cam follower and a crank arm for connection to a picker stick.

2. In a pick shaft assembly for a loom, the combination comprising a bearing rod, bracket means for supporting the ends of said bearing rod against rotation and adapted to be mounted on a loomside, a tubular pick shaft encircling said bearing rod and having a crank arm for a pick cam follower and a crank arm for connection to a picker stick, and bearing bushings connected to the inside of said shaft near opposite ends thereof and embracing said rod with bearing fits.

3. In a pick shaft assembly for a loom, the combination as described in claim 2, in which said bushings have annular outer end flanges abutting the outer ends of said pick shaft.

4. In a pick shaft assembly for a loom, the combination comprising a rod, a pair of brackets supporting the ends of said rod and adapted to be mounted on a loomside, a tubular pick shaft encircling said rod and supported thereon for rotation, said pick shaft having a crank arm for a pick cam follower and a crank arm for connection to a picker stick, and a coil spring encircling said pick shaft and having one end anchored to one of said brackets and the other end secured to said pick shaft, said spring being arranged to bias said pick cam follower crank arm towards the pick cam.

5. In a pick shaft assembly for a loom, the combination comprising a pick shaft, means supporting said shaft for rotation and comprising a pair of mounting brackets near the opposite ends of said shaft adapted to be secured to a loomside, a thrust bearing threaded in one of said brackets coaxially with said shaft and acting to resist axial thrust on said shaft resulting from pick camming action on said shaft, said thrust

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bearing being axially adjustable by turning to take up play resulting from wear on surfaces in thrust bearing contact, said latter bracket being split on one side of said thrust bearing, whereby said bracket has a clamping action on said thrust bearing, and means passing through the split sections of said latter bracket for varying the clamping action of said latter bracket on said thrust bearing, whereby said thrust bearing may be loosened for adjustment or locked in adjusted position.

6. In a pick shaft assembly for a loom, the combination comprising a bearing rod, a pair of mounting brackets for supporting the ends of said bearing rod against rotation and adapted to be mounted on a loomside, a tubular pick shaft encircling said bearing rod and having a crank arm for a pick cam follower and a crank arm for connection to a picker stick, bearing bushings connected to the inside of said shaft near opposite ends thereof and embracing said rod with bearing fits, one of said bushings having an annular outer end flange abutting the corresponding outer end of said pick shaft, and a tubular thrust bearing for said shaft threaded into the mounting bracket nearest to the flanged bearing bushing and embracing the corresponding end of said rod with a slide fit for adjustment therealong, said thrust bearing having one end engaging said bushing flange and acting thereby to resist axial thrust on said shaft resulting from pick camming action on said shaft.

7. In a pick shaft assembly for a loom, the combination comprising a bearing rod, means adapted to be mounted on a loomside supporting the ends of said rod against rotation and endwise movement, a tubular pick shaft encircling said rod and spaced therefrom, said pick shaft having a crank arm for connection to a picker stick, tubular bearing members at the ends of said shaft engaging said pick shaft for rotation therewith and contacting said rod for rotation relative thereto, and means on said rod and between the ends of said shaft and said supporting means engaging said tubular bearing members to prevent endwise movement of said shaft.

8. In a pick shaft assembly for a loom, the combination comprising a bearing rod, a pair of

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spaced mounting brackets, adapted to be mounted on a loomside, supporting the ends of said bearing rod against rotation and endwise movement, a tubular pick shaft encircling said bearing rod and spaced therefrom, said pick shaft having a crank arm for a pick cam follower and a crank arm for connection to a picker stick, flanged tubular bearing bushings fitting with the ends of said pick shaft for rotation therewith and encircling said rod for rotation relative thereto, and bearing means on said rod and fixed in position by said brackets adapted to bear on the flanges of said tubular bearing bushings to prevent endwise motion of said pick shaft and tubular bearing assembly.

9. In a pick shaft assembly for a loom, the combination comprising a bearing rod, a pair of spaced mounting brackets, adapted to be mounted on a loomside, supporting the ends of said bearing rod against rotation and endwise movement, a tubular pick shaft encircling said bearing rod and spaced therefrom, said pick shaft having a crank arm for a pick cam follower and a crank arm for connection to a picker stick, flanged tubular bearing bushings fitting into the ends of said pick shaft for rotation therewith and encircling said rod for rotation relative thereto, and bearing means on said rod and fixed in position by said brackets adapted to bear on the flanges of said tubular bearing bushings to prevent endwise motion of said pick shaft and tubular bearing assembly, said bearing means including a bearing member adjustably positionable along said rod to take up play resulting from wear on the surfaces of said bearing bushings and said bearing means in thrust bearing contact.

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