Aug. 18, 1931. W. E. SMITH 1,819,926

PICKER CRANK ADJUSTMENT

Filed March 17, 1928 2 Sheets-Sheet 1

Fig. 1.

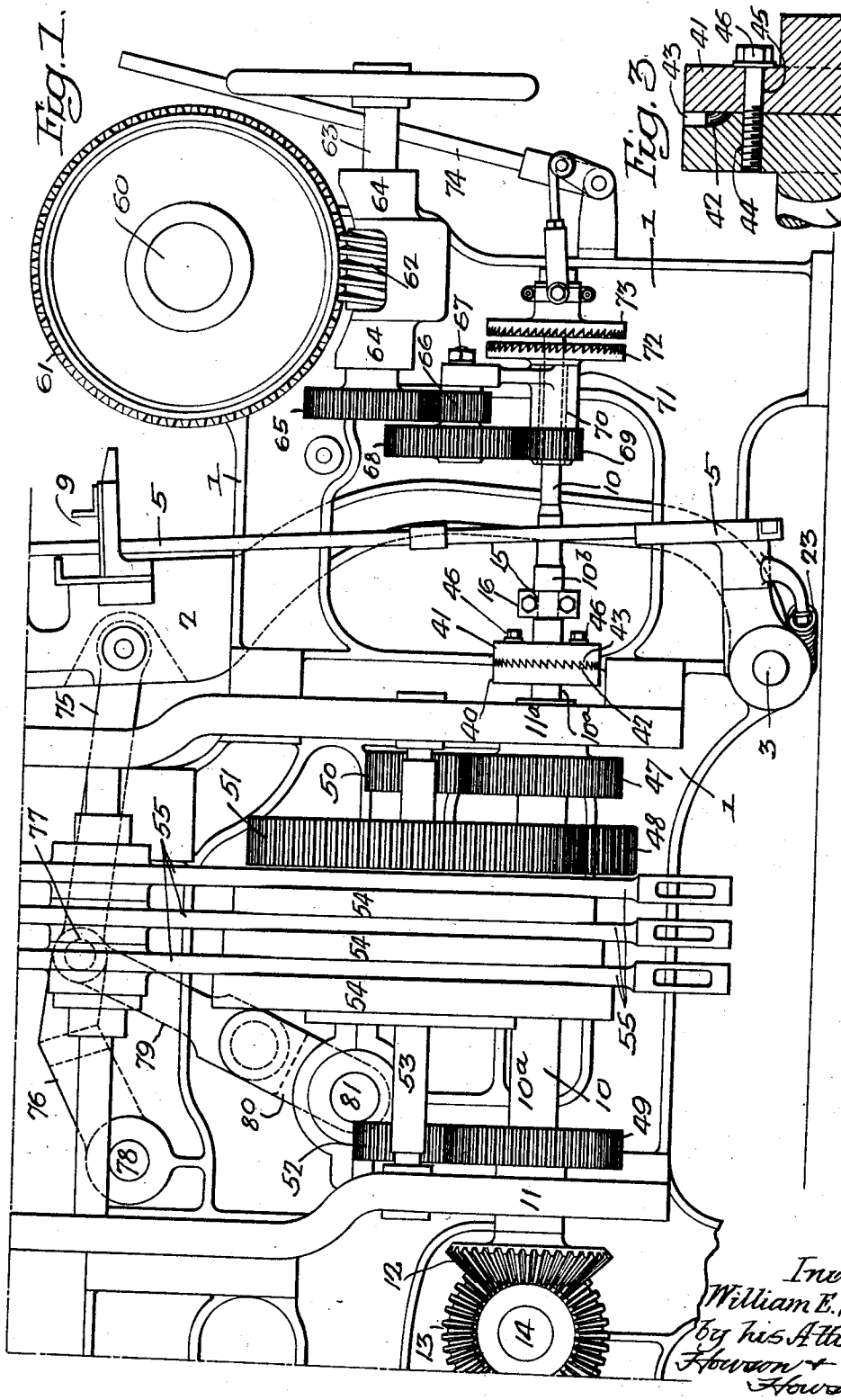


Fig. 3.

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Fig. 2.

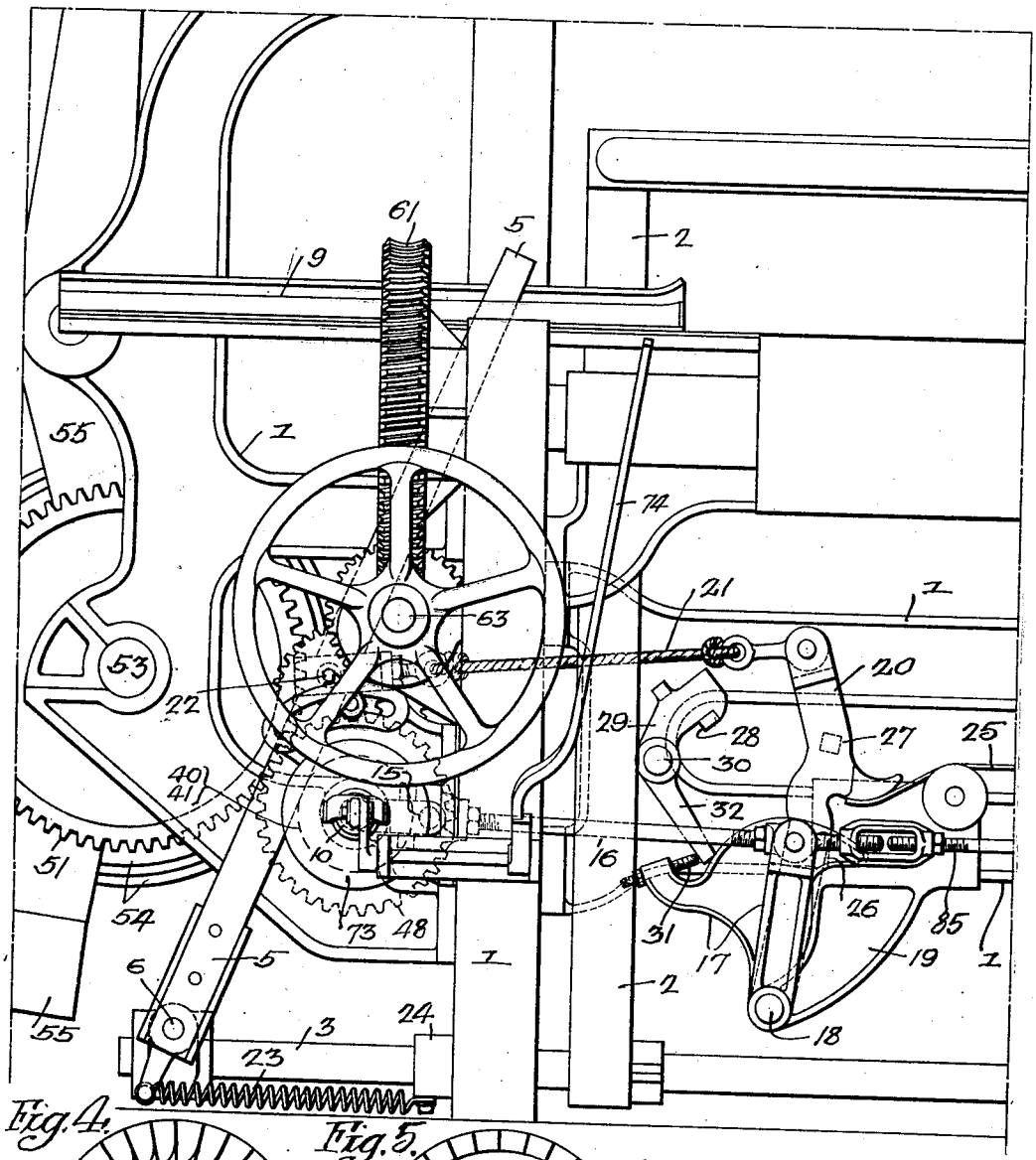


Fig. 4.

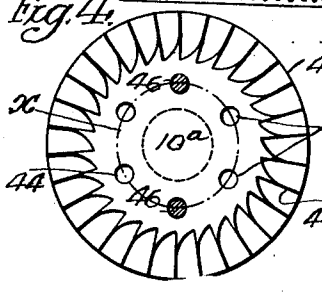
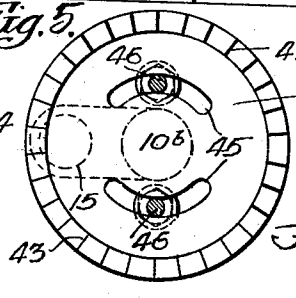


Fig. 5.



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UNITED STATES PATENT OFFICE

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PICKER CRANK ADJUSTMENT

Application filed March 17, 1928. Serial No. 262,523.

This invention relates to means permitting adjustment of the crank of the picker shaft of a carpet weaving loom relative to the body portion of the picker shaft, whereby the timing of the release of the picker sticks of the loom may be regulated with respect to the operation of certain other elements of the loom which derive their motion from, or are indirectly connected to, the said body portion of the picker shaft.

The body portion and crank portion of the picker shaft, heretofore, have been made integral with each other. Certain elements of the loom receive their motion from gears which are normally secured to and rotate with the body portion of the picker shaft. When it was found necessary to adjust the picker crank to correct the timing of the release of the picker stick, as effected by the picker crank, with respect to the other elements of the loom, such as the beat up of the lay, etc., it was necessary to release all the said gears which are normally secured to and carried by the body portion of the picker shaft, and to slide these gears longitudinally of the picker shaft and with respect to the gears with which they mesh, in order that the angular position of the crank of the picker shaft could be corrected to bring the time of release of the picker sticks into correct relation with respect to the motion of the lay, or other operating elements of the loom. After adjusting the position of the picker crank, each of the gears had to be placed in a correct position on the picker shaft and remeshed with their cooperating gears so that the keyways or other locking means, which secured the gears against rotation with respect to the shaft, were in proper alignment with the keyways in the shaft.

This operation required several hours of a skilled mechanic's time and necessitated the loom being idle during the time the adjustment was being made.

The object of this invention is to construct the picker shaft in such a manner that the adjustment of the crank may be made in a few minutes, thereby saving the time of the mechanic and eliminating the long idle period of the loom. The construction of my invention will be fully disclosed hereinafter, reference being had to the accompanying drawings, of which:

Fig. 1 is an end elevation of sufficient of a carpet weaving loom to illustrate my invention as applied thereto;

Fig. 2 is a front elevation of one end of the loom;

Fig. 3 is a sectional elevation of a portion of the picker shaft illustrating the connection between the body portion and the crank portion thereof;

Fig. 4 is a face view of a head formed on one end of the body portion of the picker shaft; and

Fig. 5 is a face view of a head formed on one end of the crank portion of the picker shaft.

As shown in the drawings, 1 indicates the main frame of the loom, and 2 indicates the lay of the loom, pivoted at 3 to the said frame. One of the picker sticks is illustrated at 5, being pivoted at 6 to the end of the shaft 3, on which the said lay is pivoted.

The picker shaft is shown at 10 being rotatably mounted in bearings 11, 11*a* on the frame 1 of the loom. Adjacent the bearing 11 and secured to the adjacent end of the picker shaft 10 is a mitre gear 12 which meshes with a similar gear 13 secured to a shaft 14, which is rotatably mounted in the frame 1. The shaft 14 is continuously driven from a source of power not shown and through the gears 13 and 12 transmits a continuous rotation to the picker shaft 10.

Adjacent the bearing 11*a* the picker shaft is provided with a crank 15, which is connected by a link 16 to a lever 17, pivoted at 18 to a bracket 19, which is secured to the main frame 1 of the loom. Also pivoted at 18 is a lever 20, the outer end of which is connected by means of the rope or other flexible connecting element 21 to the picker stick 5, at a point 22 located above the pivot point 6 of the said picker stick. Below the pivot 6 of said picker stick is connected one end of a spring 23, the opposite end of which is secured to a collar 24 fixed to the pivot shaft 3. The spring 23 tends to turn

the picker stick about its pivot, and thereby move the upper end of said picker stick toward the outer end of the shuttle box 9 carried by the lay 2. The upper end of the picker stick 5 is moved in an opposite direction by the usual spring (not shown) which has one end connected to a band 25, the other end of said band being secured to the lever 20.

As the picker crank 15 is rotated the lever 17 is rocked about its pivot, and a projection 26 thereon engages the lever 20 and rocks the same about its pivot, which produces slack in the flexible connector 21. This slack is taken up by the spring 23 turning the picker stick about its pivot 6. Continued motion of the crank 15 causes the lever 20 to be rocked about its pivot until a projection 27 thereon is brought into position to be engaged by a shoulder 28 of a latch 29, which is pivoted at 30 to the frame 1. In this position the operating spring (not shown), which is connected to the end of the band 25, is stretched, and this spring is thereby placed and held under tension.

Continued rotation of the picker shaft 10 and its crank 15 causes the lever 17 to be rocked about its pivot in an opposite direction and, at a predetermined time, the rocking of the lever 17 in this direction causes the end of a threaded stud 31, carried by the lever 17, to engage an arm 32 on the latch 29, whereby the said latch is rocked about its pivot 30 and the shoulder 28 of said latch is released from the projection 27 on the lever 20. Release of the lever 20 also releases the picker stick operating spring, secured to the end of the band 25, and the contraction of said spring causes the connector 21 to suddenly and violently jerk the picker stick 5 thereby turning the stick on its pivot 6, and the upper end of said stick to engage one end of a shuttle located in the shuttle box 9. The shuttle is thereby thrown across the loom through the open warp shed, to carry a weft thread through the said shed in the usual manner.

The release of the lever 20 must take place at a definite time with respect to the motion of the lay, and for this purpose it is found necessary to adjust the crank 15 at various times. To facilitate this adjustment, the picker shaft is made in two parts, a body portion 10*a* and a crank portion 10*b*. I provide on the end of the body portion 10*a* of the picker shaft 10, adjacent the bearing 11*a*, a head 40, which in the present instance is formed integral with the body portion of said shaft for the purpose of strength. On the crank portion 10*b* of said picker shaft 10, I integrally form a head 41. The adjacent faces of the heads 40 and 41 are provided with teeth 42 and 43 respectively, which are adapted to engage each other in a manner illustrated in Fig. 1, for the purpose of preventing circular slippage between the two portions of the said picker shaft.

In the head 40, I provide a series of tapped holes 44 which are evenly spaced on a circle concentric with the center of rotation of the shaft 10, as indicated at *x* on Fig. 4. The head 41 of the crank portion 10*b* of the said picker shaft is provided with a pair of arcuate slots 45 which are concentric with the center of rotation of said shaft, the center of the said slots being coincident with the circle *x* on which the tapped holes 44 in the head 40 are located. Bolts 46, 46 pass through the slots 45 and into the threaded openings 44 in the head 40 whereby the heads 40 and 41 are rigidly secured together and rotate as a single body.

As shown in Fig. 1, on the body portion 10*a* of the picker shaft 10 are secured a number of gears 12, 47, 48 and 49 respectively. These gears mesh with gears 50, 51 and 52 which are adapted to operate other elements of the loom in timed relation to the beat up of the lay 2. For example, the gear 51 is secured to a shaft 53 on which is secured cams 54, 54 which, through levers 55, 55, operate the harness frames of the loom.

In order to adjust the picker crank 15 without disturbing any of the gears 12, 47, 48 and 49 the securing bolts 46 are backed off to release the head 41 from the head 40 whereupon the portion 10*b* of the picker shaft, on which the crank 15 is formed, may be rotated with respect to the body portion 10*a* of said picker shaft and the timing of the release of the lever 20 thereby regulated.

The end of the portion 10*b* of the picker shaft, opposite the head 41 thereon, is adapted to drive the take up shaft 60, on which is secured a worm wheel 61 which meshes with a worm 62 secured to a shaft 63 rotatably mounted in bearings 64, 64 on the frame 1. On one end of the shaft 63 is a gear wheel 65 which meshes with a gear 66 rotatably mounted on a stud 67 secured in the frame 1. Secured to the pinion 66 is a gear 68 which meshes with a pinion 69 secured to one end of a sleeve 70, which is rotatably mounted in a bearing 71 secured to the frame 1. On the opposite end of the sleeve 70 is secured the clutch element 72.

The portion 10*b* of the picker shaft extends axially through the sleeve 70, and on the outer end of said shaft is splined a clutch element 73 which is adapted to be moved into and out of engagement with the clutch element 72 by means of a lever 74, thus the outer end of the shaft portion 10*b* is rotatably supported, and when this section 10*b* of the shaft is rotated with respect to the section 10*a* thereof the section 10*b* is permitted to slide axially through the sleeve 70, to permit the teeth 43 of the head 41 to pass the teeth 42 in the head 40 while

the adjustment is being made, after which the bolts 46 are again tightened to draw the teeth into mesh with each other and to prevent relative circular movement between the two sections of the picker shaft.

In Fig. 1, the lay 2 is shown as being connected by a toggle link 75 to a second toggle link 76 at 77, the opposite end of the toggle link 76 is pivotally connected to the frame 1 as indicated at 78. The pivotal connection 77 between the toggle links 75—76 is connected by means of a connecting rod 79 with a crank 80 formed on a crank shaft 81 rotatably mounted in the frame 1. The lay operating crank shaft 81 is operatively connected to the shaft 14 in a manner to operate the lay once for a given number of operations of the picker shaft 10. In some cases the lay is operated once for each operation of the picker shaft while in other cases the lay may be operated once for each two or three operations of the picker shaft depending upon the character of the fabric being woven. For this reason it is necessary to time the operations of the picker crank accurately with respect to the operations of the lay, and the principal object of this invention is to construct the picker shaft in a manner to facilitate this adjustment.

It is understood by those skilled in the art that there is a picker stick, such as that illustrated a 5 in Fig. 2, a lever 20, a lever 17 and a latch 29, at the opposite end of the loom, and that these levers 17, 17 are connected by means of a link 85, Fig. 2, for operation by the picker shaft 10.

It is also understood that the lever 20 at the opposite end of the loom is provided with a strap 25 similar to that illustrated in Fig. 2 and that the operating spring, before mentioned, is connected at its opposite ends to the free ends of the straps 25, 25 for operating either of the picker sticks 5 when the respective levers 20 are released from the respective catches 29.

The construction of the heads 40 and 41 is such that regardless of their circular relation to each other at least one of the tapped holes 44 in the head 40 will be aligned with each of the slots 45 in the head 41 for the reception of the securing bolt 46 and that the teeth 42 and 43 in the respective heads 40 and 41 are of such proportions that a slight circular adjustment may be made between the two heads, and that when the bolts 46 are tightened the two heads 40 and 41 and the attached shaft sections 10 and 10*a* rotate as a single element without fear of slippage therebetween.

I claim:—

1. The combination in a loom, of a picker shaft comprising a main section and a crank portion including a shaft section axially aligned with the main section, a plurality of operating elements rigidly secured to said main section in predetermined relation to each other, and means for adjusting the crank shaft section circularly with respect to said main shaft section, for timing the crank with respect to said plurality of operating elements without disturbing the predetermined relationship of the said plurality of operating elements on said main section.

2. The combination in a loom, of a picker shaft comprising a main section and a crank portion including a shaft section axially aligned with the main section, a plurality of operating elements rigidly secured to said main section in predetermined relation to each other, means for adjusting the crank shaft section circularly with respect to said main shaft section, for timing the crank with respect to said plurality of operating elements without disturbing the predetermined relationship of the said plurality of operating elements on said main section, and means for positively locking said shaft portions against relative circular movement with respect to each other after the adjustment has been made.

3. The combination in a loom, of a picker, shaft comprising a main section and a crank portion including a shaft section axially aligned with the main section, a plurality of operating elements rigidly secured to said main section in predetermined relation to each other, means for adjusting the crank shaft section circularly with respect to said main shaft section, for timing the crank with respect to said plurality of operating elements without disturbing the predetermined relationship of the said plurality of operating elements on said main section, said adjusting means comprising a head on and formed integral with one end of each of said shaft portions, co-operating teeth formed on the adjacent faces of the respective heads, and means for securing said heads rigidly together.

4. The combination in a loom, of a picker shaft comprising a main section and a crank portion including a shaft section axially aligned with the main section, a plurality of operating elements rigidly secured to said main section in predetermined relation to each other, means for adjusting the crank shaft section circularly with respect to said main shaft section, for timing the crank with respect to said plurality of operating elements without disturbing the predetermined relationship of the said plurality of operating elements on said main section, said adjusting means comprising a head on and formed integral with one end of each of said shaft portions, co-operating teeth formed on the adjacent faces of the respective heads, one of said heads having a series of apertures formed therein and located on a circle

concentric with the axis of the shaft, the other of said heads having a series of arcuate slots arranged with their centers concentric with the axis of the shaft and coincident with the centers of the apertures formed in the other of said heads, the respective slots being of a length embracing any two adjacent apertures of the other head, and bolts adapted to pass through said slots and certain of said apertures for securing the heads rigidly together.

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