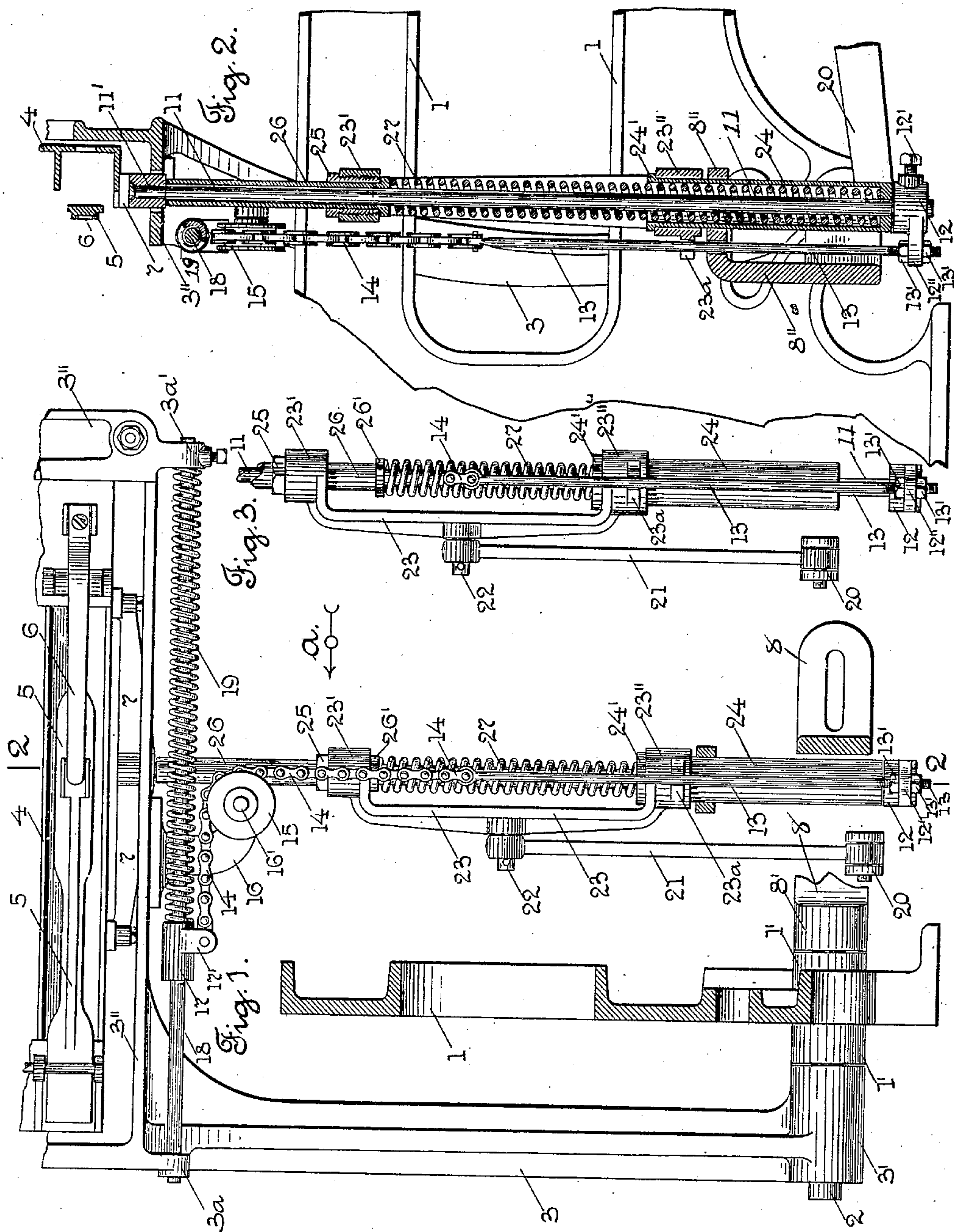


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W. M. WATTIE.
LOOM SHUTTLE BOX MECHANISM.

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UNITED STATES PATENT OFFICE.

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LOOM-SHUTTLE-BOX MECHANISM.

No. 868,308.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed December 9, 1905. Serial No. 291,048

To all whom it may concern:

Be it known that I, WILLIAM M. WATTIE, a subject of Great Britain, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Loom-Shuttle-Box Mechanism, of which the following is a specification.

My invention relates to loom shuttle box mechanism, and more particularly to a loom shifting shuttle box lifter rod, and a give-way spring combined therewith, to prevent the breaking of moving parts, and a counterbalance spring to counterbalance the weight of the shuttle boxes.

The object of my invention is to improve upon the ordinary construction of the box lifter rod, and the give-way spring, and parts connected therewith, and the counterbalance spring, which counterbalances the weight of the shuttle boxes.

My invention consists in certain novel features of construction of my improvements, as will be hereinafter fully described.

I have shown in the drawing a detached part of a shifting shuttle box mechanism, and my give-way spring attachment, and counterbalance spring, combined with the shuttle box lifter rod, sufficient to enable those skilled in the art to understand the construction and operation of my improvements. *

Referring to the drawing:—Figure 1 is a front sectional view of the right hand end of a loom side, and a front view, partially in section, of a shifting shuttle box mechanism, with my improvements combined therewith. Fig. 2 is a section, on line 2, 2, Fig. 1, looking in the direction of arrow *a*, same figure. Fig. 3 shows the box lifter rod, and the give-way spring attachment, shown in Fig. 1, detached, and in a different position.

In the accompanying drawing, 1 is a portion of the right hand end loom side, having a bearing 1' thereon for the shaft 2, on the inner side of which is loosely mounted the hub 3' on the lower end of the lay-sword 3. At the upper end of the lay-sword 3 and at the end of the lay beam, not shown, is the horizontal extension 3'', and the vertical extension 3''', forming the frame for the shifting shuttle boxes, only one of which, 4, is shown. The shuttle box 4 has a binder 5 thereon, and the binder actuating spring 6, in the usual way.

7 is the box bearing plate secured upon the underside of the box 4.

On the outer side of the loom side 1, and on the outer end of the shaft 2, is mounted the hub 8' of the rocker iron 8, having the extension 8'' thereon, see Fig. 2, adapted to guide the box lifter rod 11, in the usual way.

All of the above mentioned parts may be of the usual and well known construction.

I will now describe my improvements.

The box bearing plate 7, on the underside of the shuttle box 4, has in this instance the reduced end 11' of the shuttle box lifter rod 11, see Fig. 2, extending through its central enlarged portion, and the upper end of the reduced end 11' spread or riveted, to secure the upper end of the shuttle box lifter rod 11 to the bearing plate 7. The lifter rod 11 has attached to its lower end, in this instance by a set screw 12', an adjustable collar 12. The collar 12 has on one side thereof an extension 12'', with a hole therethrough to receive the lower threaded end of a vertically extending rod 13, adjustably secured in said extension 12'' by two nuts 13', on said rod 13. The rod 13 is pivotally connected at its upper end to one end of a link chain 14; said link chain 14 passes over a guide sheave 15, journaled on a stud 16' in the lower end of a bracket 16, which is secured at its upper end to the lower part of the horizontal portion 3'' of the stationary box frame. The other end of the chain 14 is secured to an extension 17' on a collar 17, which is loosely mounted on a rod 18, which extends in a horizontal plane, and is secured at each end in extensions 3^a and 3^{a'} on the lower part of the stationary box frame on the lay end, see Fig. 1. Encircling the rod 18 is an expansion spring 19, one end of which bears against the extension 3^{a'}, and the other end against the collar 17 loosely mounted on the rod 18.

One end of the shuttle box lever 20, shown in part in Fig. 3, is pivotally connected with the lower end of a link or connector 21. The upper end of the connector 21 is pivotally mounted on a pin 22 extending out from the central vertical portion of the yoke shaped vertically moving stand or slide 23. The slide 23 moves up or down according to the movement of the box lever 20, to raise and lower the shuttle boxes. The slide 23 has two hubs 23', and 23'' thereon; the lower hub 23'' is adapted to slide on a sleeve 24, having an external annular lip or flange 24' on its upper end, against which the upper end of the hub 23'' bears, and an opening through its lower closed end, to loosely receive the box lifter rod 11, see Fig. 2. The upper hub 23' on the slide 23, has in this instance a tubular bushing 25 screwed therein, from the upper side thereof, which bushing is loosely mounted and slides on a sleeve 26, loosely mounted on the upper end of the vertically moving box lifter rod 11, and having an annular flange or extension 26' on its lower end, adapted to engage the lower end of the hub 23', and its upper end extending under, and adapted to engage the central lower part of the bearing plate 7.

An expansion spring 27 encircles the box lifter rod 11, and at its lower end extends loosely within the sleeve 24, and bears against the lower closed end of said sleeve. The upper end of the spring 27 bears against the annular

flange 26' on the lower end of the sleeve 26, see Fig. 2. The spring 27 acts as a give-way spring, and also acts to move and hold apart the sleeves 24 and 26 on the box lifter rod 11, and cause the flange 24' on the lower sleeve 24 to engage with the upper end of the lower hub 23'' of the slide 23, and the flange 26' on the sleeve 26 to engage with the lower end of the hub 23' on the slide 23. The hub 23'' has guide projections 23^a thereon, for the rod 13.

The collar 12, on the lower end of the box lifter rod 11, must be properly adjusted on said lifter rod, according to the length of the sleeves 24 and 26, to cause the sleeve 24 to bear at its lower end against said collar, and the flange 24' on the upper end of said sleeve 24 to bear against the upper end of the hub 23'' on the slide 23; and the upper end of the sleeve 26 to bear against the lower side of the shuttle box bearing plate 7, and the lower flanged end 26' to bear against the lower end of the hub 23' on the slide 23, to form a spring give-way attachment, to normally move the shuttle boxes up and down, through the spring 27, according to the movement of the shuttle box lever 20, connector 21, and slide 23.

If in case of a shuttle failing to properly enter a shuttle box, or for any other reason, the shuttle box lifter rod 11, and shuttle boxes, are prevented from moving upwardly, the continued movement of the shuttle box lever 20, connector 21, slide 23, will cause the spring 27 to be compressed, see Fig. 3, between the upwardly moving sleeve 24 and the lower end of the sleeve 26, which is held and prevented from moving upwardly, and thus prevent the breaking of any parts. The same is true, if the lifter rod 11 and shuttle boxes are prevented from moving downwardly. The downward movement of the box lever 20, through connector 21, will move downwardly the slide 23, and the sleeve 26 through flange 26' on said sleeve, and will contract the spring 27, and leave the box lifter rod 11 and shuttle boxes stationary.

The spring 19 on the horizontally extending rod 18, through its expansive force and connections, from the loosely mounted collar 17, engaged by said spring, to the collar 12 on the lower end of the rod 11, acts to lift the rod 11 and counterbalance the weight of the shuttle boxes.

The advantages of my improvements will be readily appreciated by those skilled in the art; they are of simple construction, and may be applied to shifting shuttle box mechanisms of any ordinary construction.

It will be understood that the details of construction of my improvements may be varied if desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a shifting shuttle box mechanism, the combination with a vertically moving shuttle box lifter rod, of connections to the shuttle box lever, said connections comprising therein a spring encircling said rod, a sleeve loosely mounted on said rod and loosely inclosing and forming a bearing for one end of said spring, and a second sleeve loosely mounted on said rod and forming a bearing for the other end of said spring, and a vertically moving slide having hubs thereon through which said sleeves loosely extend, and said hubs, adapted to be engaged by annular flanges or projections on said sleeves.

2. In a shifting shuttle box mechanism, the combination with a vertically moving shuttle box lifter rod, of connections therefrom to the shuttle box lever, said connections comprising therein a spring encircling said rod, a sleeve loosely mounted on said rod and loosely inclosing and forming a bearing for one end of said spring, and a second sleeve loosely mounted on said rod and forming a bearing for the other end of said spring, and a vertically moving slide having hubs thereon through which said sleeves loosely extend, and said hubs, adapted to be engaged by annular flanges or projections on said sleeves, said annular projections being held in engagement with said hubs by the expansion of said spring in the normal operation of the loom, and either one of said annular projections allowed to move out of engagement with its hub, by the contraction of said spring.

3. A give-way spring attachment for a vertically moving shuttle box lifter rod, consisting of a helically coiled expansion spring loosely encircling said rod, and extending at one end within and having a bearing in a sleeve, and said sleeve loosely mounted on said rod, and bearing at its other end against a sleeve, and said sleeve loosely mounted on said rod, and a vertically moving slide having two hub portions thereon, one for each sleeve, to loosely receive the same, and adapted to be engaged by a flange or projection on each sleeve, and connections from said slide to a box lever.

4. A give-way spring attachment for a vertically moving shuttle box lifter rod, consisting of a helically coiled expansion spring loosely encircling said rod, and extending at one end within and having a bearing in a sleeve, and said sleeve loosely mounted on said rod, and bearing at its other end against a sleeve, and said sleeve loosely mounted on said rod, and a vertically moving slide having two hub portions thereon, one for each sleeve, and adapted to be engaged by a flange or projection on each sleeve, and the upper hub having a tubular bushing screwed therein, to loosely receive the upper sleeve, and connections from said slide to a box lever.

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