No. 862,668. PATENTED AUG. 6, 1907.

J. J. SHANAHAN.

HEAD MOTION FOR LOOMS.

APPLICATION FILED AUG. 27, 1906.

4 SHEETS—SHEET 1.

FIG. 1.

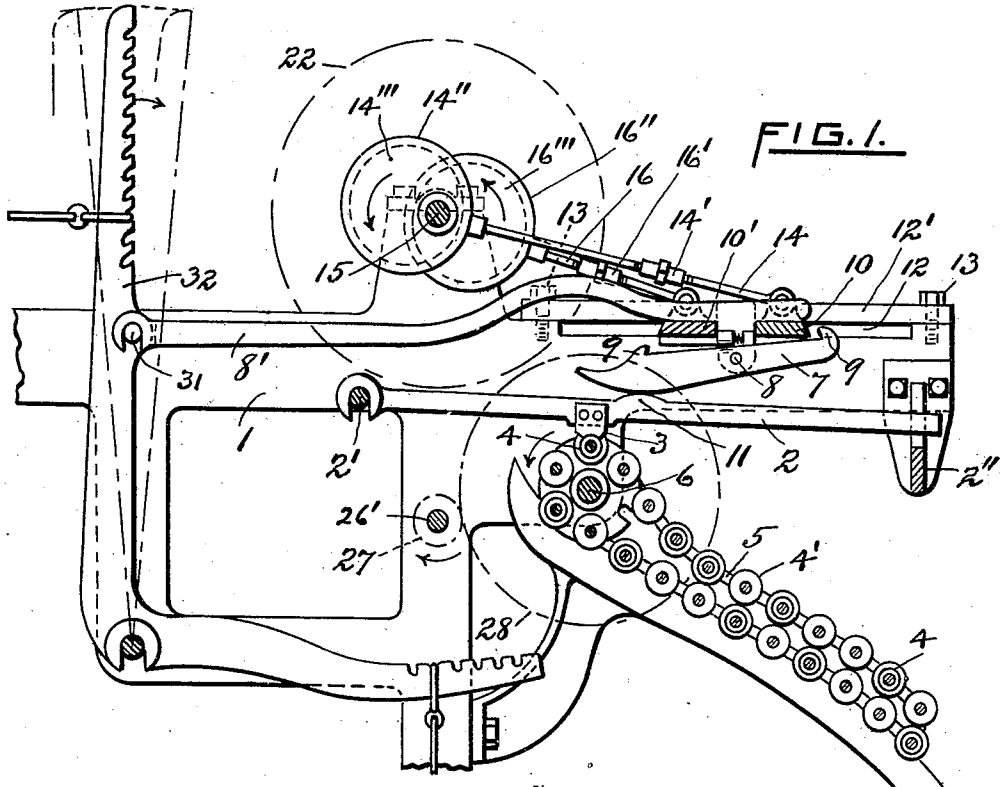
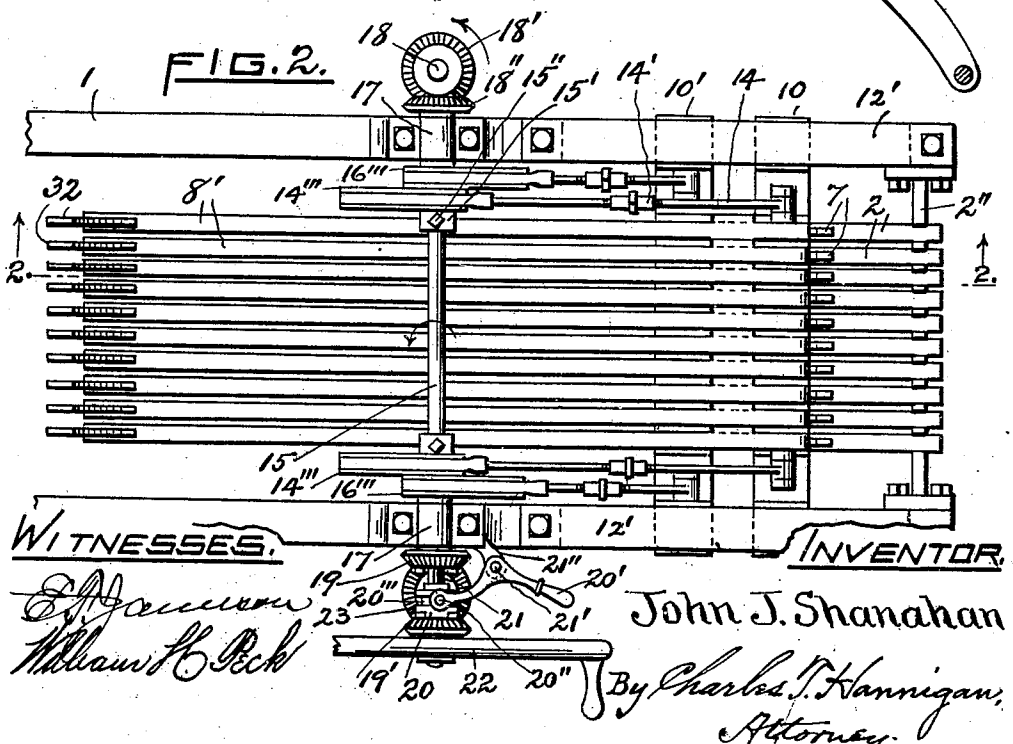


FIG. 2.



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4 SHEETS—SHEET 2.

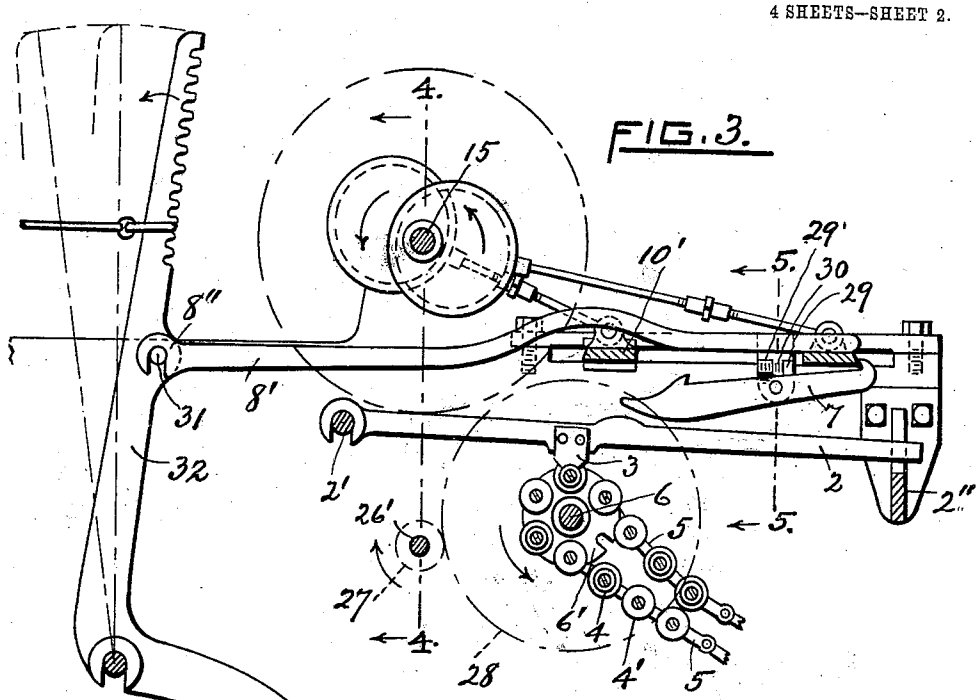


FIG. 3.

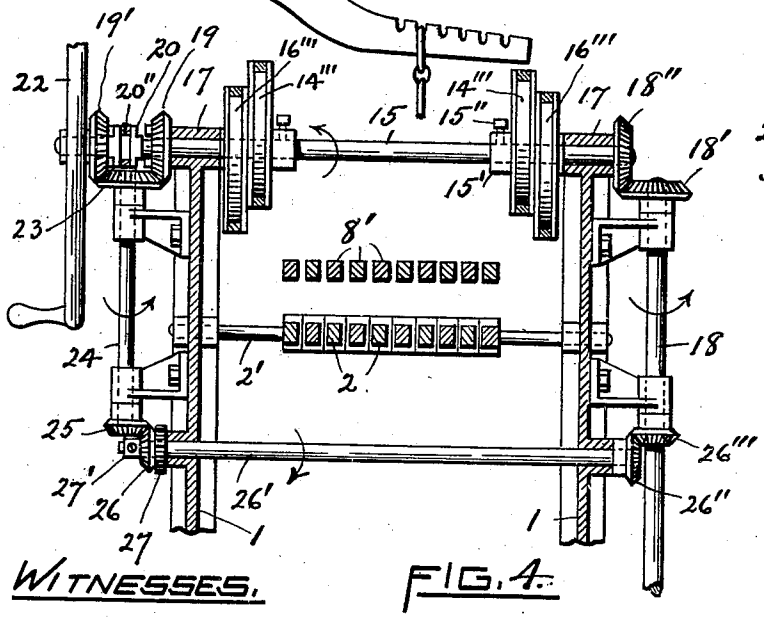


FIG. 4.

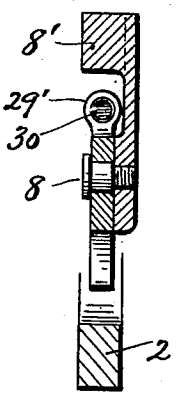


FIG. 5.

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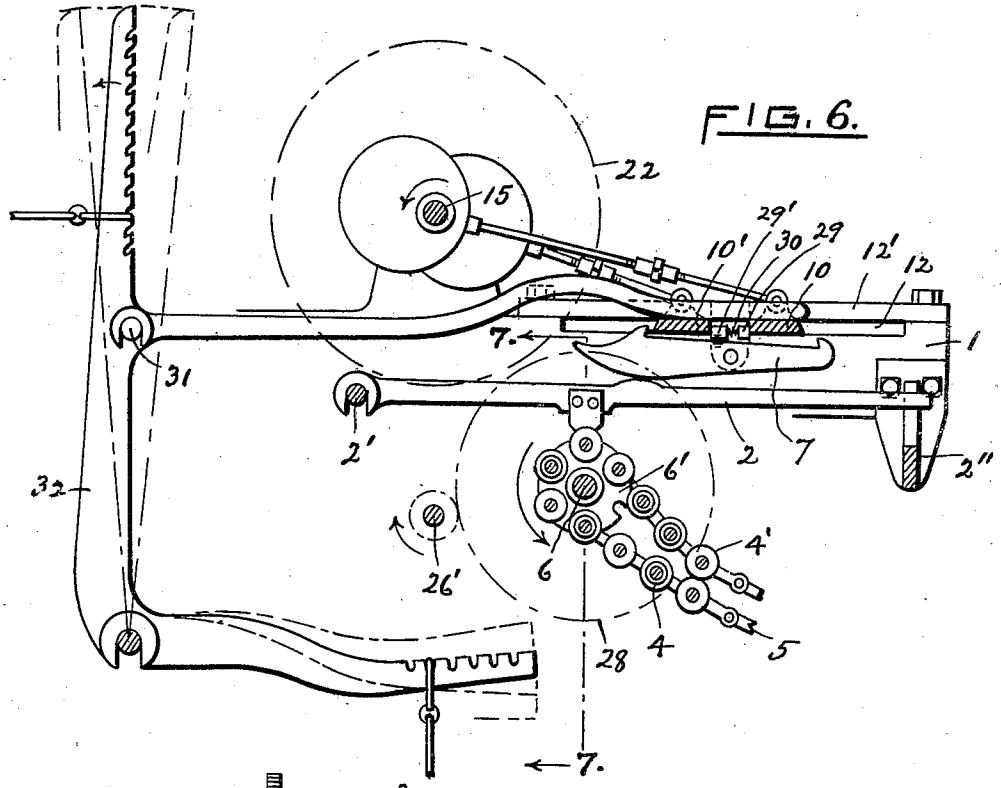
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4 SHEETS—SHEET 3.

FIG. 6.



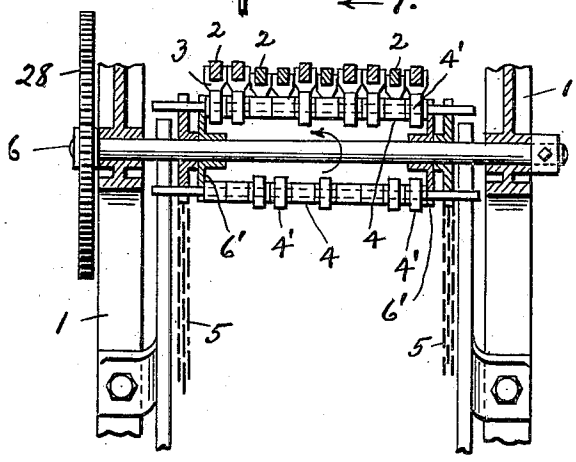


FIG. 7.

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No. 862,668. PATENTED AUG. 6, 1907.

J. J. SHANAHAN.

HEAD MOTION FOR LOOMS.

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4 SHEETS—SHEET 4.

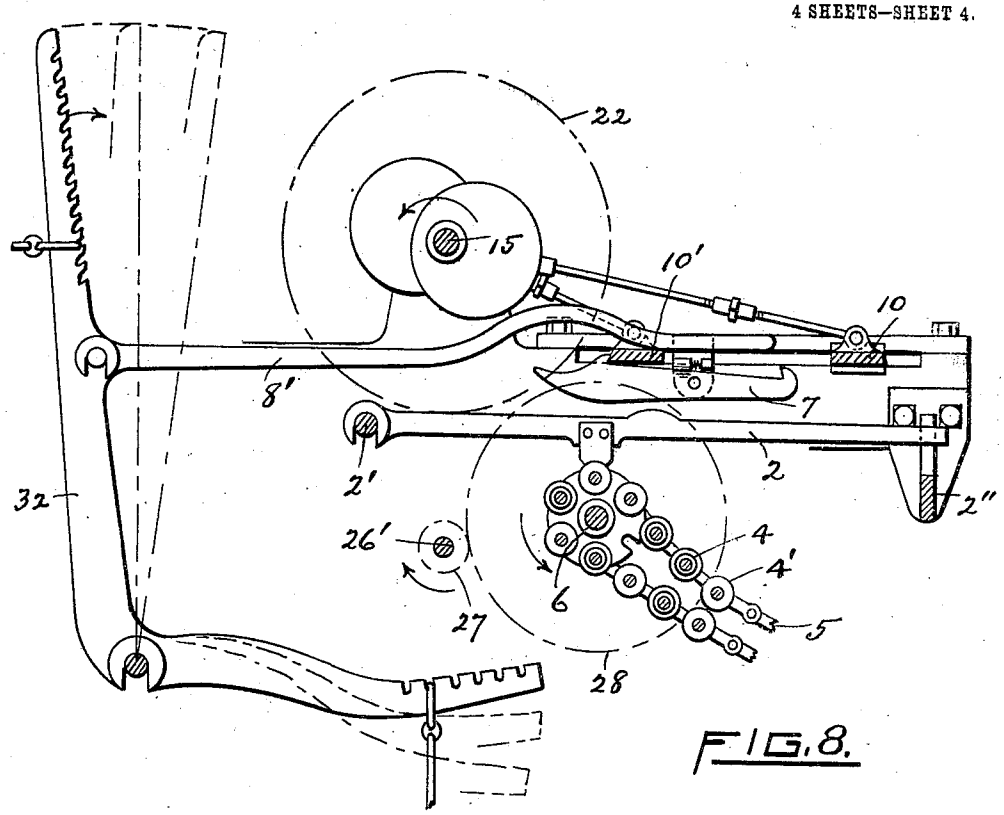


FIG. 8.

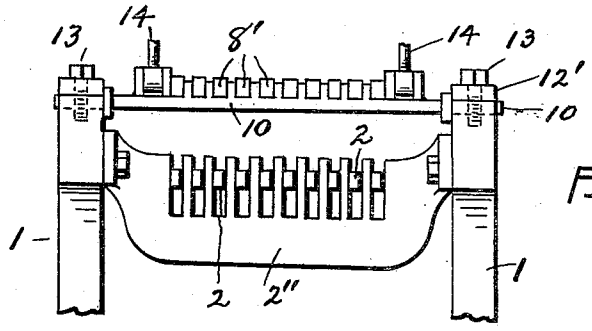


FIG. 9.

WITNESSES.

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UNITED STATES PATENT OFFICE.

JOHN J. SHANAHAN, OF CENTERVILLE, RHODE ISLAND.

HEAD-MOTION FOR LOOMS.

No. 862,668. Specification of Letters Patent. Patented Aug. 6, 1907.

Application filed August 27, 1906. Serial No. 332,300.

To all whom it may concern:

Be it known that I, JOHN J. SHANAHAN, a citizen of the United States, residing at Centerville, in the county of Kent and State of Rhode Island, have invented certain new and useful Improvements in Head-Motions for Looms, of which the following is a specification.

This invention has relation to head motions for looms, and the invention is especially adapted to close shed looms particularly that type of close shed looms employed in weaving fancy woolens and worsteds.

The primary object of the invention is to simplify the construction of head motion parts in looms of the character above referred to, and to render the head motion parts more convenient for adjustment by the weaver when the loom is stopped, and to cause the harnesses to be brought to a level, whereby any broken threads may be readily drawn in through the harnesses, thus effecting a saving in the time it takes the weaver to unlock and level the harness and find the pick in open shed looms of the old style.

A further object of this invention is to decrease the expense due to the wear and breakage of the pattern-chain.

Other objects and purposes of the invention will be developed in the following specification and the invention conists in the novel construction, combination and arrangement of parts hereinafter described and claimed.

I have illustrated my improvements in the accompanying drawings, in the several figures of which like numerals designate corresponding parts, and in which:—

Figure 1 is a longitudinal sectional view of the frame and moving parts, said view being taken on the dotted line 2—2 of Fig. 2, and illustrating the parts in their normal position, as when the harnesses are closed and at their middle position of travel. Fig. 2 is a top plan view of the same. Fig. 3 is a view similar to Fig. 1, but showing the moving parts in a different position. Fig. 4 is a transverse sectional view taken on the dotted line 4—4 of Fig. 3, and illustrating the driving arrangement of the head motion. Fig. 5 is an enlarged sectional view taken on the dotted line 5—5 of Fig. 3. Fig. 6 is a view similar to Fig. 1, showing some of the parts in a different position. Fig. 7 is a vertical sectional view through the chain cylinder and taken on the dotted line 7—7 of Fig. 6. Fig. 8 is a longitudinal sectional view showing the relative position of parts when the harness has traveled to its extreme downward movement, and Fig. 9 is a front elevation of the loom head and showing a fixed bracket for supporting the free ends of the lift-levers.

1 designates the frame of the loom constructed and adapted to support the stationary and movable parts hereinafter described.

A plurality of lift-levers 2 are fulcrumed at one end on a cross-rod 2′ and at their opposite ends are supported by a stationary bracket 2″ carried by the frame 1. The lift-levers 2 carry contact blocks 3, which are adapted to come into contact with sinkers 4, carried by a pattern-chain 5, that travels around a shaft 6, which is journaled in the frame 1. A finger hook 7, is pivotally-mounted on a stud 8, carried by jack-connection 8′ and said finger hook has a tooth 9 at each end, the tooth at one end of the finger hook being adapted to engage a front knife 10, and the tooth at the other end being adapted to engage a rear knife 10′, according to the position of the finger hook. The finger hook 7, is rocked on the stud 8, by means of a swell or rise 11, on the lift-lever 2, which swell or rise contacts with the long edge of the finger hook near one end thereof.

The front knife 10, and the rear knife 10′ are seated at their ends in horizontal grooves 12, formed in the frame 1, these grooves being carried by plates 12′, which are held in position by bolts 13 at their ends, so that the grooves and the plates form horizontal slots or ways in which the knives are movable in a horizontal plane.

Motion is communicated to the front knife 10, through an eccentric rod 14, provided with a turn-buckle 14′, by means of which the length of the rod is adjusted, said rod being connected to an eccentric strap 14″ carried by an eccentric 14‴ mounted on a horizontal shaft 15, and motion is communicated to the rear knife 10′ through an eccentric rod 16, having a turn-buckle 16′, the rod 16 being connected to an eccentric strap 16″ carried by an eccentric 16‴ also mounted on the shaft 15. The eccentrics 14‴ and 16‴ are attached together and both are adjustably fixed on the shaft by means of a hub 15′ carried by each of the eccentrics 14‴, and set screws 15″ passing through said hubs 15′ and engaging the shaft 15.

The shaft 15 is journaled in suitable bearings 17, carried by the frame 1, and motion is imparted to the shaft from a vertical driving shaft 18 through intermeshing beveled gears 18′ and 18″ carried respectively by the vertical shaft 18, and the horizontal shaft 15. The end of the shaft 15 opposite that end which carries the beveled gear 18″ extends some distance beyond the frame 1, and upon this extended end are loosely mounted two beveled clutch gears 19 and 19′ respectively, and between the gears 19, 19′ a double ended clutch 20 is mounted, this clutch being keyed on the shaft as shown at 21, and adapted to alternately engage the inner faces of the beveled clutch gears 19 and 19′, motion being imparted to the clutch 20 by means of a hand-lever 20′ pivoted at 21′ to a bracket 21″ carried by the frame 1, a pin 20″ carried by the lever 20′ seats in a central peripheral groove 20‴ formed in the clutch 20. A hand wheel 22 is mounted on the extreme end of the shaft 15,

and by means of said hand wheel the shaft may be manually operated to find the pick or time when desired.

A beveled gear wheel 23 is disposed below and is constantly in mesh with both of the beveled gear wheels 19, 19′, carried by the shaft 15, the beveled gear wheel 23 being mounted on a vertical shaft 24, that carries on its lower end a beveled pinion 25, which meshes with a beveled pinion 26, the beveled pinion 26 and a spur gear 27 being carried by and loose on a shaft 26′ that is journaled in the frame 1. A collar 27′ is fixed on the shaft 26′ outside of the beveled pinion 26 and serves to retain the beveled pinion and spur gear from displacement upon the shaft.

The spur gear 27 is in mesh with a gear wheel 28, which is fixed upon the shaft 6, and motion in either direction is imparted to shaft 6 by means of the clutch member 20 and the clutch gears 19, 19′, such motion being communicated from the shaft 15 to the shaft 24, and thence through the beveled pinion 25, beveled pinion 26, and spur gear 27 to the shaft 6, and, by means of sprockets 6′ carried by said shaft and fixed thereon to the pattern-chain 5. A lug 29 is carried by the jack-connection 8′ and an opposing lug 29′ is carried by the finger hook 7, and between the lugs 29, 29′ is mounted a push-spring 30, which seats in a socket in the lug 29′, and serves to incline the finger hook 7 to the position shown in Fig. 3.

The jack-connections 8′ have hooked ends 8″ that engage studs 31 carried by jacks 32.

The parts being constructed and arranged as above described operate in the following manner: Motion is communicated to the vertical drive shaft 18, and from any suitable source of power is in turn communicated to the horizontal shaft 15 through the medium of the beveled gears 18′ 18″, and, motion is communicated to the vertical shaft 24 from the shaft 15 in one direction or the other according to whichever of the clutch gears 19 or 19′, the clutch 20 is engaged with. The motion imparted to the vertical shaft 24 is in turn imparted through the beveled pinions 25, 26, and the spur gear 27, to the gear wheel 28, and shaft 6, and, through the sprocket wheels carried by the shaft 6 to the pattern-chain 5. The pattern-chain being kept in motion operates to raise and lower the lift-levers 2, accordingly as the contact blocks carried by the lift-levers encounter the sinkers 4, or the rollers 4′ carried by the pattern-chain 5. By the movement of the pattern-chain 5, the lift-levers will be elevated or depressed, and the finger hooks 7 will either be elevated to the position shown in Fig. 6, or Fig. 8, in which position they are engaged by the rear knife 10′ or they will be rocked to the position shown in Fig. 3, where they are engaged by the front knife 10. Accordingly as the finger hooks are engaged by the front knife 10 or the rear knife 10′, the jack connections will be moved in one direction or the other, and correspondingly move the jacks 32.

The rotary movement imparted to the horizontal shaft 15 as hereinbefore described will impart movement to the eccentrics 14‴, 16‴, and the movement of these eccentrics will produce a reciprocating movement in opposite directions of the front knife 10, and the rear knife 10′, and the movement of these knives will, in the manner well known effect, the desired movement of the jack connections 8′, and the jacks 32.

If for any reason it should be found necessary to reverse the direction of movement of the pattern-chain, as, for instance, to find a filling thread which is broken, such reversal can be readily effected by reversing the position of the clutch 20, through the medium of the hand-lever 20′, so as to cause the clutch to leave that one of the clutch gears 19, 19′ with which it has been engaged, and then engage the other of said clutch gears. This movement of the clutch 20 will produce a reversal of the movement of the vertical shaft 24, and a consequent reversal of the movement of the pattern chain and shaft 6, and, when the pattern chain has been caused to travel a sufficient distance, in the desired direction, the clutch 20 can be readily returned to its first position and the pattern-chain caused to move in its original direction of movement.

If at any time it should be desired to operate the head motion by hand, in order to find the pick or time, this can be readily effected through the medium of the hand wheel 22.

The usual box-motion (not shown) extends from the shaft 15 to the shaft 26′, and said box-motion is driven by means of the gears 26″ and 26‴, which are keyed respectively on said shaft 26′ and drive shaft 18.

Therefore, it is evident that by my construction and arrangement of parts, as described, I form a head motion for looms, of the type employed in weaving fancy woolens and worsteds, that is effective in operation, and at the same time a construction of lesser expense to manufacture over the ordinary head motion now in vogue.

What I claim is:

1. In a head motion for looms, the combination of a power driven horizontal shaft; eccentrics fixed upon said shaft; straps surrounding said eccentrics and carrying rod-connections; knives horizontally movable and connected to the rods of said straps; a power driven pattern-chain carrying sinkers and rollers; pivotally mounted lift-levers to contact with the sinkers and rollers of said chain, and each lever having a swell upon its upper portion; jack-connections having each an integral lug; finger-hooks pivotally mounted on said jack-connections, each hook having a tooth at each end to engage said knives and also an integral lug, and a push-spring between the lugs of said jack-connections and lugs of said finger-hooks to incline the latter toward the swell of said lift-levers.

2. In a head motion for looms, the combination of a power driven horizontal shaft; eccentrics adjustably secured on said shaft; horizontally arranged knives; straps surrounding said eccentrics, and each strap having a rod-connection to each of said knives; turn-buckles carried by each rod-connection of said straps for adjusting the normal position of the knives relatively to one another; jack-connections extending over said knives and each jack-connection having an integral lug located between each knife; rocking finger-hooks carried by said jack-connections and each hook having a tooth at each end to engage said knives, and each hook having an integral lug provided with a socket; a push-spring mounted in each socket of said hooks to bear against the lug of each jack-connection in holding the hooks inclined; pivotally mounted lift-levers beneath said hooks, and each lever having a swell to contact with the inclined portions of the latter; a fixed bracket to support the free ends of said levers, and a power driven pattern-chain carrying sinkers and rollers to contact with in lifting said levers.

3. In a head motion for looms, having a horizontal shaft driven by power to impart a reciprocating motion to the knives of the loom, the combination therewith, of two beveled gears loosely mounted on said shaft and each gear having a clutch face; a double ended clutch keyed on said shaft and slidable thereon; a hand-lever to move said clutch into engagement with either clutch face of said gears; a hand-wheel made fast on the end of said

shaft; a second shaft vertically arranged and mounted in suitable supports of the loom-frame; a beveled gear made fast on second mentioned shaft and in mesh with first mentioned beveled gears; a third shaft horizontally arranged and rotatable in journal bearings of the loom-frame; a spur gear loose on last mentioned shaft and adapted to impart motion to the pattern-chain-shaft of the loom; a beveled gear loose on last mentioned shaft and secured to said spur gear, and a beveled gear on second mentioned shaft and in mesh with the beveled gear on third mentioned shaft.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN J. SHANAHAN.

Witnesses:
E. F. JAMESON,
WILLIAM H. PECK.