This invention relates to driving devices for pattern mechanism and it is the principal object of the invention to provide a driving shaft having operative connection with a multiple of devices and movable about a fixed center away from said devices to facilitate adjustment and assembly.

It is a more particular object of my invention to mount the upright shaft of the well-known Knowles head in such a way as to permit the same to be swung in a vertical plane away from the take-up, selvage and head driving devices without twisting or bending said shaft.

It is a further object of my invention to provide an improved driving connection between the upright pattern mechanism driving shaft and the bottom shaft of a loom.

With these and other objects in view which will appear as the description proceeds, my invention resides in the combination and arrangement of parts hereinafter described and set forth in the claims.

In the accompanying drawings, wherein I have shown one form of my invention,

Fig. 1 is a side elevation of the rear portion of a loom having my invention applied thereto, the front of the loom being at the left of the structure shown,

Fig. 2 is a vertical section taken on line 2—2 of Fig. 1, and

Fig. 3 is a vertical section taken on line 3—3 of Fig. 2.

Referring to the drawings it will be seen that I have provided a loom frame 10 in the lower portion of which is mounted for rotation a shaft 11 driven in any approved manner by mechanism conveniently located on the opposite side of the loom. Upstanding from the frame 10 is an arm 12 having an arm 13 extending rearwardly therefrom and supporting upper and lower bevel gears 14 and 15, respectively, said bevel gears cooperating with the cylinders of the well-known Knowles head as shown in Patent No. 124,923 issued Jan. 22, 1873, to L. J. Knowles.

A stand 16 is secured to the frame 10 and has extending therefrom a stud 17 on which is rotatably mounted a selvage motion bevel gear 18. A take-up shaft 19 similar to that illustrated in Patent No. 810,280 is rotatably mounted in a bearing 20 and carries on the rear end thereof a gear 21 which meshes with a second gear 22 fastened to shaft 23, said shaft being received by bearing 24 formed on a plate 25 secured to the loom frame. The rear end of shaft 23 has secured thereto a bevel gear 26 by means of which the same may be rotated to cause rotation of shaft 19.

My invention relates more particularly to the upright shaft 30 by means of which the motions heretofore described are actuated. The upper end of said shaft has secured thereto upper and lower bevel gears 31 and 32, respectively, by means of which the head motion bevel gears 14 and 15, respectively, are actuated. Extending between the gears 31 and 32 is a bearing 33 one portion 34 of which is secured to the foot 13, and the other portion of which is formed as a cap 35 and secured to the portion 34. At a point intermediate the height thereof the shaft 30 is provided with a second bearing 36 formed in part by a portion 37 which is formed integral with the plate 16 and in part by a cap 38 removable from the portion 37 and lying on the same side of the shaft as cap 35.

A bevel gear 39 is secured to the shaft 30 in proper position for engagement with gear 18. Below the gear 39 is a sleeve 40 mounted for sliding motion on shaft 30 and having upper and lower bevel gears 41 and 42, respectively, one of which will be in mesh with the bevel gear 26. The vertical position of the sleeve 40 is determined by a lever 43 pivoted at 44 to the plate 25, said lever being controlled as to position by means of a bell crank lever 45 pivoted to the stand 16 and receiving motion from the reversing mechanism (not shown) of the head.

The bottom of the upright shaft is provided with a clutch indicated generally at 46 by means of which said shaft receives motion from the bottom shaft. The clutch comprises a sleeve 47 fixed to the upright shaft, a sleeve 48 sliding thereon and having extending therefrom a pin 49, and a bevel gear 50 which receives the lower end of the pin 49. The sleeve 48 is positioned by means of a lever 51 controlled through an arm 52 which may be raised or lowered at will by the operator when it is desired to turn the head by hand.

The bevel gear 50 meshes with a corresponding bevel gear 53 shown in the present
instance as mounted on the hub 54 of a plate 55 keyed to the bottom shaft at 56. The angular position of the gear 53 may be varied with respect to the plate 55 by means of bolts 57 which pass through slots 58 formed in the plate 55.

The bottom of shaft 30 is received in an upwardly extending bearing 59 formed in an angularly adjustable support 60. Said support is provided with a flange 61 having slots 62 therein through which extend bolts 63 which secure the flange 61 to a bearing 64 fixed to the loom frame 10. The flange 61 is held tightly to the bearing 64 by the bolts 63 but can be moved angularly with respect thereto when the bolts are loose.

When the head is improperly timed it is necessary to correct the timing by adjusting the angular position of the shaft 30 with respect to the bottom shaft 11. Under such conditions the cap bearings 32 and 33 can be moved, the bolts 63 loosened and the shaft moved rearwardly in a vertical plane about the bottom shaft as a center to the position indicated in dotted lines in Fig. 1, causing the support 60 to rotate about the extension of the bottom shaft 11 which passes therethrough. When in such position the shaft can be raised in a direction radial with respect to the shaft 11 to move the gear 50 out of mesh with gear 53 and rotated on its axis either to the right or left, as indicated by arrow A, depending upon which adjustment is required. The upwardly extending bearing 59 is sufficiently long to retain the bottom of the shaft 30 when the latter is raised enough to disengage the gears as described. After the gears have been given their proper adjustment the shaft may again be lowered and returned to upright position as shown in Fig. 1, the caps 55 and 56 replaced and the bolts 63 tightened.

From the foregoing it will be seen that I have provided a very simple means for mounting the driving shaft of the well known Knowles head in such a way as to permit the same to be swung rearwardly to allow adjustment thereof with respect to the bottom shaft. Also, it will be seen that I have provided for the adjustment of bevel gear 53 with respect to the bottom shaft.

Having thus described my invention it will be apparent that changes and modifications may be made therein by those skilled in the art without departing from the spirit and scope of the invention, and I do not wish to be limited to the details herein disclosed, but what I claim is:

1. In a loom, a driving shaft, a pattern mechanism, a driven shaft interposed between the driving shaft and the pattern mechanism to actuate the latter, and a pivotal support for one end of the driven shaft, said support being movable about the driving shaft as a center said driven shaft being movably with the support about the driving shaft out of operative engagement with the pattern mechanism and radially with respect to the driving shaft out of operative engagement with the latter so that said driven shaft may be turned independently of the driving shaft.

2. In a loom, a driving shaft, a pattern mechanism, a driven shaft interposed between the driving shaft and the pattern mechanism to actuate the latter, and means located adjacent the driving shaft and movable about the same as an axis to support one end of the driven shaft, said driven shaft being movably with the means about the driving shaft out of operative engagement with the pattern mechanism and radially with respect to the driving shaft out of operative engagement with the latter so that said driven shaft may be turned independently of the driving shaft.

3. In a loom, a driving shaft, a driven shaft normally operatively connected thereto, a pattern mechanism actuated by said driven shaft, and a separate bearing for each shaft, one of said bearings being movable about one of the shafts and supporting the other shaft, and adjustably secured to the other bearing the shaft supported by the bearing movable about the other shaft being movable away from and out of engagement with said other shaft so as to be rotatable independently of said other shaft.

4. In a loom, a driving shaft, a pattern mechanism, a driven shaft interposed between the driving shaft and the pattern mechanism to actuate the latter, driving connections between the driven and the driving shafts, and a support for the driven shaft adjacent the driving connections, said support being movable about the driving shaft said driven shaft being movable with the support about the driving shaft out of operative engagement with the pattern mechanism and radially with respect to the driving shaft out of operative engagement with the latter so that said driven shaft may be turned independently of the driving shaft.

5. In a loom, a pattern mechanism, a driving shaft, a driven shaft, connections between the driven shaft and the pattern mechanism to actuate the latter, connections between the driving shaft and the driven shaft to actuate said driven shaft, and a bearing for said driven shaft movable about the driving shaft as an axis said driven shaft being movable with the bearing about the driving shaft out of operative engagement with the pattern mechanism and radially with respect to the driving shaft out of operative engagement with the latter so that said driven shaft may be turned independently of the driving shaft.
6. In a loom, a pattern mechanism, a driving shaft, a driven shaft interposed between the driving shaft and the pattern mechanism to actuate the latter, and a bearing for that end of the driven shaft adjacent the driving shaft pivotally mounted about said driving shaft to assume different angular positions, the end of the driven shaft remote from the driving shaft being movable away from the pattern mechanism, and the end of the driven shaft adjacent the driving shaft maintaining the same relation with said driving shaft as said driven shaft moves away from the pattern mechanism and said driven shaft being movable away from the driving shaft after the same has been moved away from the pattern mechanism.

7. In a loom, a driving shaft, a pattern mechanism, a driven shaft interposed between the driving shaft and the pattern mechanism to actuate the latter, driving connections between the shafts, a bearing for the driven shaft pivoted about the axis of the driving shaft and having portions to guide the driven shaft when the latter is moved to disconnect the driving connections between the shafts, said driven shaft being movable with the bearing about the driving shaft out of operative engagement with the pattern mechanism and radially with respect to the driving shaft out of operative engagement with the latter so that said driven shaft may be turned independently of the driving shaft.

8. In a loom, a pattern mechanism, a driving shaft, a driven shaft interposed between the driving shaft and the pattern mechanism to actuate the latter, a gear normally moving with the driven shaft, a member secured to the driving shaft and moving therewith, and a second gear secured to and angularly adjustable with respect to said member said second gear having driving connection with the gear on the driven shaft.

9. In a loom, a pattern mechanism, a driving shaft, a driven shaft for the pattern mechanism, a gear normally moving with the driven shaft, a pivotal support for that end of the driven shaft adjacent the driving shaft, said support being movable about the axis of the driving shaft, and a driving gear secured to and angularly adjustable with respect to the driving shaft said driving gear meshing with the first named gear to actuate the driven shaft.

In testimony whereof I have hereunto affixed my signature.

WILLIAM M. WATTIE.