

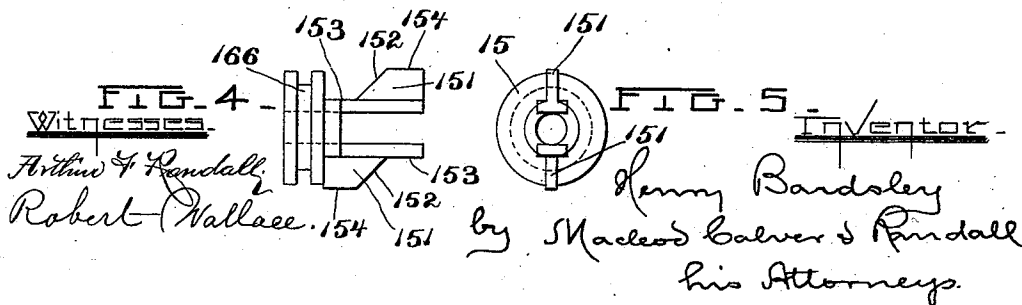
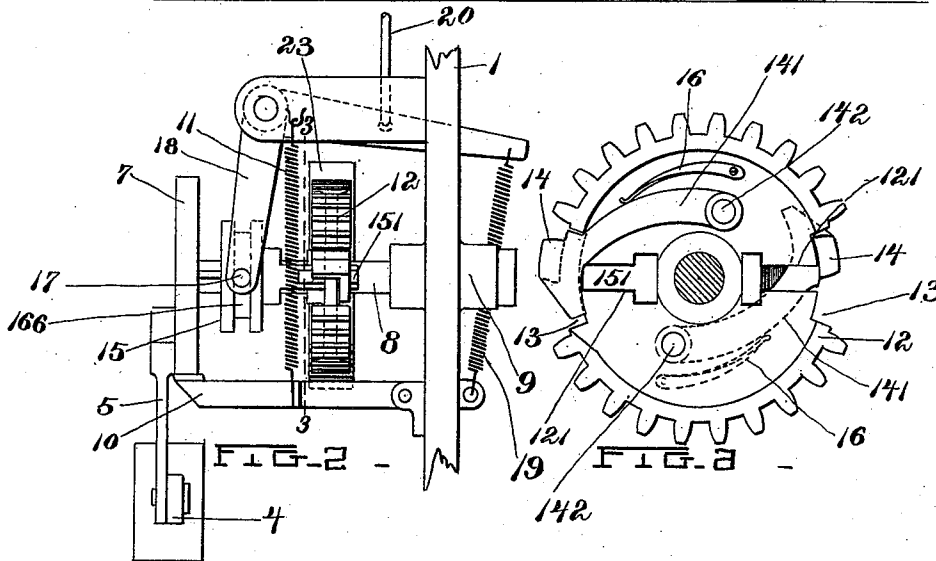
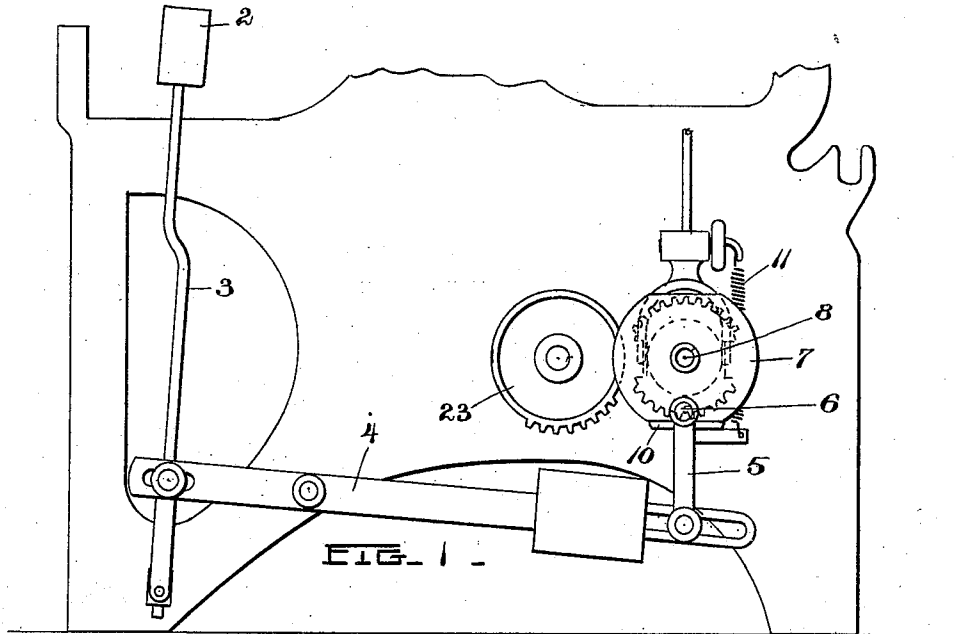
(No Model.)

H. BARDSLEY.

SHUTTLE BOX OPERATING MECHANISM FOR LOOMS.

No. 528,758.

Patented Nov. 6, 1894.



UNITED STATES PATENT OFFICE.

HENRY BARDSLEY, OF SOUTH HADLEY FALLS, ASSIGNOR TO THE KNOWLES
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SHUTTLE-BOX-OPERATING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 528,758, dated November 6, 1894.

Application filed January 2, 1894. Serial No. 495,320. (No model.)

To all whom it may concern:

Be it known that I, HENRY BARDSLEY, a citizen of the United States, residing at South Hadley Falls, in the county of Hampshire and State of Massachusetts, have invented certain new and useful Improvements in Shuttle-Box-Operating Mechanism for Looms, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention is designed principally as an improvement in mechanism for operating the shifting or change shuttle-boxes of looms, although certain of the essential features thereof are capable of being employed in other connections, and is applicable mainly to box-motions of the class in which the shuttle-boxes are in operative connection with one or more cranks or eccentrics, each of the latter having imparted to it at predetermined times a movement of semi-rotation for the purpose of moving the shuttle-boxes in one direction or the other, and changing the cell thereof which is presented in line with the shuttle raceway on the lathe. Certain types of box-motions pertaining to the class just mentioned have the crank or eccentric aforesaid arranged in operative connection with a toothed gear or pinion, which last, at certain times, that is when it is desired to impart movement of partial rotation to the crank or eccentric, is caused to become engaged by a moving toothed surface, constituted sometimes by what is known as a master-gear, and thereby the said toothed gear or pinion is rotated to the extent necessary, usually through a semi-rotation, to shift the connected crank or eccentric sufficiently to produce the required change in the position of the shuttle boxes.

The invention is serviceable when embodied in box-motions of these types.

It consists in an improved construction and combination of parts, which first will be described with reference to the accompanying drawings, and then will be particularly pointed out and distinctly defined in the claims at the close of this specification.

In the drawings, Figure 1 is a view in side elevation of one of the side frames of a loom having applied thereto a simple form of box-motion embodying my invention. Fig. 2 is a view showing the said box-motion as it ap-

pears when viewed from the right-hand side in Fig. 1, that is to say, from the rear of the loom. Fig. 3 is a view in vertical section on line 3—3 of Fig. 2, looking toward the left-hand side in the latter figure. Fig. 4 is a view in side elevation of the sliding collar hereinafter described. Fig. 5 is a view in end elevation of the said sliding collar.

At 1 in the drawings is the loom-frame, at 60 2 the shuttle-boxes, at 3 the shuttle-box-rod, at 4 a box-operating lever having the forward end thereof connected with the box-rod 3, at 5 a connecting-rod having one end thereof joined to the rear arm of the lever 4, at 6 a 65 crank-pin to which the other end of such connecting rod is joined, at 7 a disk on which the said crank-pin is mounted, at 8 a short shaft on which the disk 7 is secured, and at 9 a bearing for the said shaft provided on the 70 framing. The edge of the disk 7 is flattened at opposite sides of the center thereof, and against the said edge bears the squaring lever 10, acted upon by spring 11, whereby the disk and shaft are held stationary in definite position after each semi-rotation thereof until 75 again acted upon positively and given a further movement of semi-rotation.

The foregoing parts are representative of the devices with which may be associated 80 the improved devices in which my invention more immediately resides. I will now proceed to disclose the character of the latter.

On the shaft 8 is fixed the gear or pinion 12, which is mutilated by the omission of 85 teeth from two portions thereof which are diametrically opposite each other, indicated most clearly in Fig. 3. At the places where such omission of teeth occurs, the periphery of the gear 12 is recessed as shown at 13, 13, 90 Fig. 3 to permit the radial play of teeth 14, 14, these teeth being movable toward and from the axis of the gear in such manner as to enable them to be either projected into position to be engaged by the moving toothed 95 surface with which the gear 12 co-operates or retracted out of the range of the said moving toothed surface. Preferably, the said movable teeth 14, 14 are connected with gear 12 by forming each tooth on an arm 141, 100 which is pivoted to the gear at 142.

For the purpose of projecting the teeth 14,

14 into position to be engaged by the movable toothed surface aforesaid, which in the drawings is represented by the segmental gear 23, I mount on the shaft 8 a collar 15 which is free to slide thereon, and equip the said collar with cams that act upon the arms 141, 141. These cams are constituted, in the embodiment of my invention which is shown in the drawings, by the arms 151, 151, which pass through slots 121, 121, that are formed in the gear 12 at opposite sides of the hub of the said gear, the outer edges of the said arms being formed with inclines at 152, 152, connecting the surfaces 153, 154, that extend parallel with the axis of the shaft 8 at different distances therefrom. The inclines 152, 152, and surfaces 153, 154, occupy reversed positions on the two arms, so that when in a given position of collar 15 the surface 154 of one cam is acting to hold a tooth 14 projected, the surface 153 of the other cam is presented against the other tooth 14, which is permitted to occupy its retracted position, and when the collar is moved into its other position, the position of the teeth 14, 14, is reversed. To hold the arms 141, 141, against the cams, springs 16, 16, may be employed.

For the purpose of moving the collar 16 lengthwise of the shaft 8, it is formed with a groove 166 in which fit pins 17 in the forked end of a bell-crank 18, the said bell-crank having connected therewith a spring 19, which acts with a tendency to move it in one direction, and a wire or rod 20, which, in practice, is connected with one of the fingers or levers that are acted upon by the usual pattern-chain of the box-motion of a loom, the said wire, &c., acting to move the said collar in the other direction. The toothed surface with which the gear 12 engages at intervals is represented by the segmental gear 23, which latter is rotated at required speed.

If, in the working of the parts, a tooth 14 of gear 12 is caused to stand in projected position on the side of gear 12 which is toward the gear 23, such tooth will be struck by the first tooth of the segment on gear 23, and thereby the gear 12 will be turned until the teeth of one of the segments thereon come into mesh with those of the segment on gear 23, after which the gear 12 will be rotated through a semi-revolution until the teeth of the two gears run out of mesh at the opposite side of gear 12, the tooth 14 on the latter side having been retracted as a result of the movement of the collar which projected the other tooth. The gear 12 will remain stationary in the position thus given to it until collar 15 is moved endwise again and a tooth 14 is pro-

jected thereby on the side of gear 12 which is next to gear 23, after which a semi-rotation thereof will be occasioned as before.

I claim as my invention—

1. The combination with a moving toothed surface, a gear having toothless spaces on opposite portions thereof, operating connections intermediate such gear and the shuttle-boxes, and the said shuttle-boxes, of movable teeth located in such toothless spaces, the collar having cams acting upon said teeth, and means for shifting the said collar, substantially as described.

2. The combination with a moving toothed surface, the gear having the toothless spaces on opposite portions thereof, operating connections intermediate such gear and the shuttle-boxes, and the said shuttle-boxes, of the teeth pivotally mounted upon the said gear, the springs acting upon said teeth to press them inwardly, the collar provided with cams acting upon said teeth to press them outwardly, and means for shifting the said collar, substantially as described.

3. The combination with a moving toothed surface, the gear having the toothless spaces on opposite portions thereof, operating connections intermediate such gear and the shuttle-boxes, and the said shuttle-boxes, of the teeth pivotally mounted upon the said gear, the springs acting upon said teeth to press them inwardly, the collar provided with cams to press the said teeth alternately outward according as the said collar is shifted in one direction or the other, and means for shifting the collar, substantially as described.

4. The combination with a driver constituted by a moving toothed surface, of the driven gear having the toothless spaces on opposite portions thereof, the movable teeth occupying such spaces, and the sliding collar provided with cams for projecting said teeth alternately into position to enable the said moving toothed surface to engage therewith and rotate the gear until the teeth run out of mesh at the opposite blank space, substantially as described.

5. The combination with the gear having toothless spaces on opposite portions thereof, of the movable teeth occupying such spaces, the springs for retracting such teeth, and the collar provided with cams for projecting said teeth alternately, substantially as described.

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

HENRY BARDSLEY.

Witnesses:

W. W. LINDSEY,

WM. AIKEN KELLY, Jr.