No. 647,229. Patented Apr. 10, 1900.

G. F. HUTCHINS.

SWIVEL LOOM.

(Application filed Feb. 3, 1900.)

(No Model.)

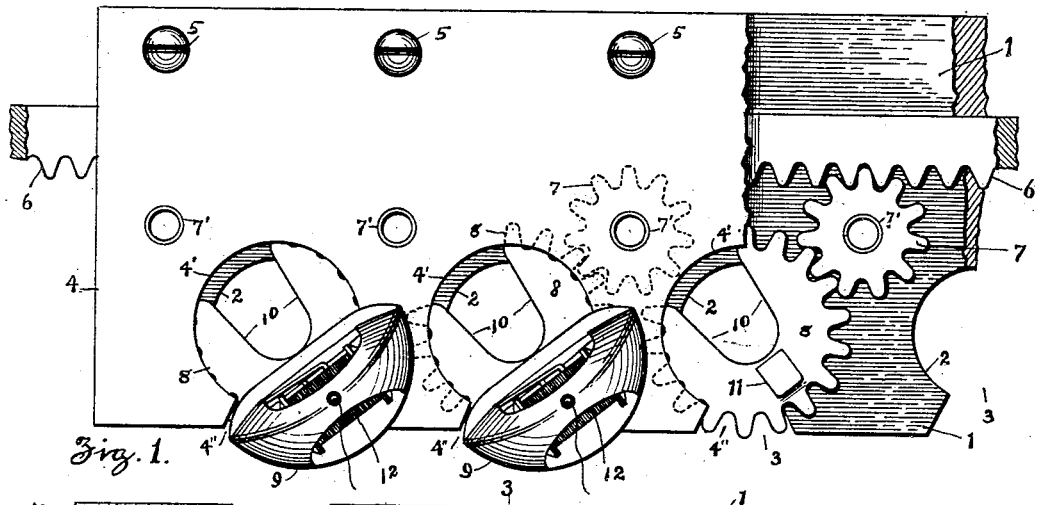

Fig. 1.

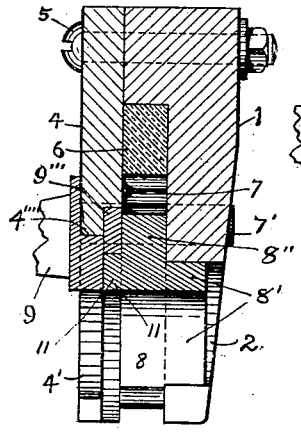

Fig. 4.

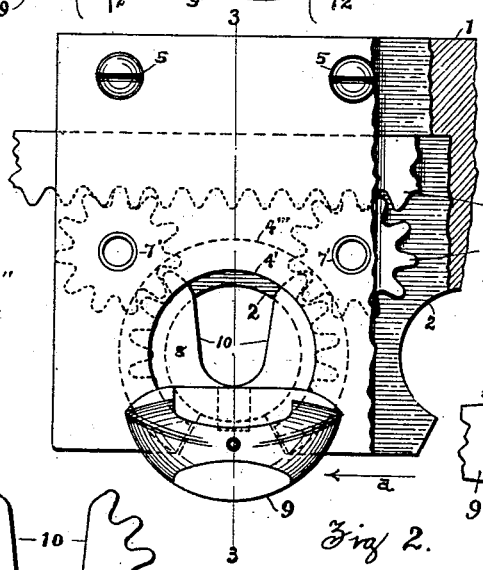

Fig 2.

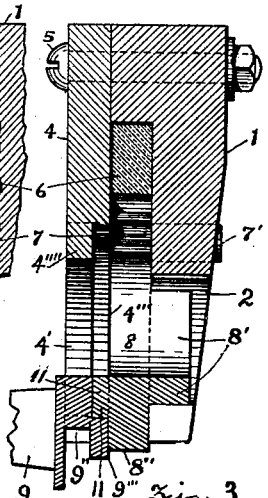

Fig. 3.

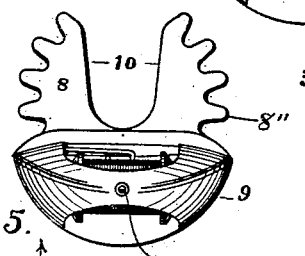

Fig. 5.

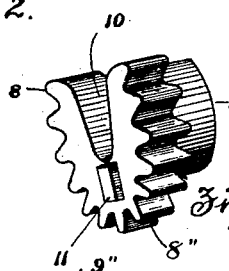

Fig. 7.

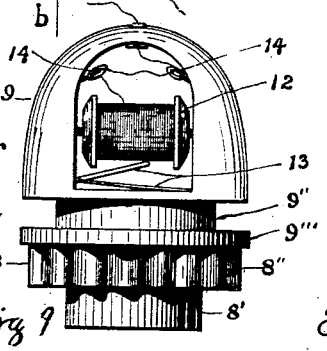

Fig 9

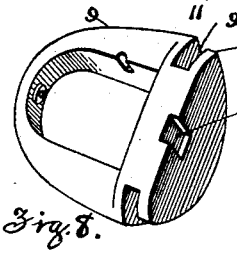

Fig. 8.

Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE F. HUTCHINS, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE CROMPTON & KNOWLES LOOM WORKS, OF SAME PLACE.

SWIVEL-LOOM.

SPECIFICATION forming part of Letters Patent No. 647,229, dated April 10, 1900.

Application filed February 3, 1900. Serial No. 3,779. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. HUTCHINS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Swivel-Looms, of which the following is a specification.

My invention relates to shuttle-motions for swivel-looms in which what are termed "horseshoe-gears" are used; and the object of my invention is to improve upon this style of shuttle-motion as heretofore made, and more particularly to provide a bearing for the swivel-shuttle independent of the bearing of the horseshoe-gear and to reduce the bearing of the horseshoe-gear and bring it nearer the central portion thereof to lessen the friction.

My invention consists in certain novel features of construction of my improved shuttle-motion, as will be hereinafter fully described.

Referring to the drawings, Figure 1 is a front view of a portion of the swivel shuttle-motion embodying my improvements. The part at the right is broken away to show the rack, pinion, and horseshoe-gear in full lines. Fig. 2 corresponds to Fig. 1, but shows one of the shuttles in a different position and at the lowest point of its movement. Fig. 3 is a vertical cross-section on line 3 3, Fig. 2, looking in the direction of arrow *a*, same figure. Fig. 4 corresponds to Fig. 3, but shows the swivel-shuttle in its opposite and highest position. Fig. 5 is a front view of a shuttle and a horseshoe-gear detached. Fig. 6 is a side view of the shuttle and gear shown in Fig. 5, looking in the direction of arrow *b*, same figure. Fig. 7 is a perspective view of a horseshoe-gear detached, and Fig. 8 is a perspective view of the shuttle detached.

In the accompanying drawings, 1 is the back plate, having in its lower portion a series of openings 2 of equal diameter and at an equal distance apart. Leading out from the lower part of each opening 2 is a passage-way 3 for the entrance of the warp-threads from below into the circular opening 2 when the shuttle is in its upper position.

Extending over the back plate 1 is a face plate 4, which is secured to the upper part of the back plate 1 by a series of screws 5. The face plate 4 has in its lower portion a series of circular openings 4′, with passage-ways 4″ leading out therefrom corresponding to the openings 2 and passage-ways 3 in the back plate 1, except that the openings 4′ are in this instance larger than the openings 2. An undercut annular channel or groove 4‴ extends around the openings 4′.

The front portion of the back plate 1 is cut away or recessed, as shown in Fig. 3, to leave a space between the back plate 1 and the face plate 4 for the horizontal moving driving-rack 6, the pinions 7, and the horseshoe-gears 8. The pinions 7 are mounted on tubes or pins 7′, extending transversely through the back plate 1 and the face plate 4, as shown in Fig. 3.

The horseshoe-gears 8, which engage and move the swivel-shuttles 9, have a hub 8′ thereon made integral with the tooth portion 8″, as shown. The gear 8 is what is termed "horseshoe" shape, with the ordinary U-shaped opening or recess 10 therein. The hub 8′ on the gear 8 extends into and has its bearing in the circular hole 2 in the back plate 1, as shown in Fig. 3. On the front of the tooth portion 8″ of the horseshoe-gear 8 is a projection 11, as shown in Fig. 7, which extends into a corresponding-shaped recess 9′ in the lower surface of the shuttle 9 to cause the shuttle 9 to move with the gear 8 as the same is operated by the pinions 7 and the rack 6 in the ordinary way.

The inner end or lower part of each swivel-shuttle 9 has an annular groove or recess 9″ therein, into which extends the edge around the opening 4′ in the front plate 4 when the several parts are assembled, as shown in the drawings. The edge 4⁗ around the opening 4′ in the front plate 4 forms a bearing-surface for the swivel-shuttle 9 to travel on independent of the horseshoe-gear. The projection or flange 9‴, forming the lower side of the groove 9″, extends into and travels in the undercut channel 4‴ around the opening 4′ in the front plate 4, as shown in section view, Fig. 4.

A spool or bobbin 12, tension-spring 13, and thread-guides 14 are secured in the swivel-shuttle 9 in the ordinary way, as shown in Fig. 6.

The operation of the swivel-shuttles in

weaving spots or figures on the fabric is well understood and need not be described herein.

The advantages of my improvements will be readily appreciated by those skilled in the art. By making the horseshoe-gear 8 with the extended hub 8′ at its central portion, which has its bearing in the opening 2 in the back plate 1, I reduce the bearing-surface, and consequently the friction. By making the swivel-shuttles with the annular groove therein, into which extends the edge around the opening on the front plate, I provide an independent bearing for the shuttle, and the shuttle is not rigidly secured to the horseshoe-gear, but only connected with it through the projection 11 thereon extending into the recess 9′ in the shuttle, so that the shuttle can be readily detached from the gear by removing the front plate 4.

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 swivel shuttle-motion, the combination with a back plate having a series of circular openings therein and passage-ways leading out therefrom, and a front plate having a corresponding series of openings and passage-ways leading out therefrom, of a rack, a series of pinions, and a series of horseshoe-gears, intermediate said back and front plates, each horseshoe-gear having a hub which has its bearing in the circular opening in the back plate, and a projection for engaging a recess in the swivel-shuttle to cause it to move with the horseshoe-gear, and said shuttle having an independent bearing, substantially as shown and described.

2. In a swivel shuttle-motion, the combination with a back plate having a series of circular openings therein and passage-ways leading out therefrom, and a front plate having a corresponding series of openings and passage-ways leading out therefrom, of a rack, a series of pinions, a series of horseshoe-gears, intermediate said back and front plates, each horseshoe-gear having a hub, which has its bearing in the circular opening in the back plate, and a projection for engaging a recess in the swivel-shuttle to cause it to move with the horseshoe-gear, and said swivel-shuttle having a groove or recess to receive the edge around the circular opening in the front plate, which acts as a bearing for the shuttle, substantially as shown and described.

3. In a swivel shuttle-motion, the combination with the back plate, having a series of circular openings therein and passage-ways leading out therefrom, of a series of horseshoe-gears driven by a rack-and-pinion mechanism to operate the swivel-shuttles, each horseshoe-gear having an integral hub which extends into and has its bearing in one of the circular openings in the back plate, and a projection thereon for engagement with the swivel-shuttles, and the swivel-shuttles having bearings independent of the horseshoe-gears, substantially as shown and described.

4. In a swivel shuttle-motion, the combination with a series of horseshoe-gears, and means for operating the same, of a series of swivel-shuttles connected with the horseshoe-gears to move therewith, but having independent bearings, substantially as shown and described.

GEORGE F. HUTCHINS.

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