

No. 644,692.

Patented Mar. 6, 1900.

J. W. SMALL.
BOX MOTION FOR LOOMS.

(Application filed Nov. 24, 1899.)

(No Model.)

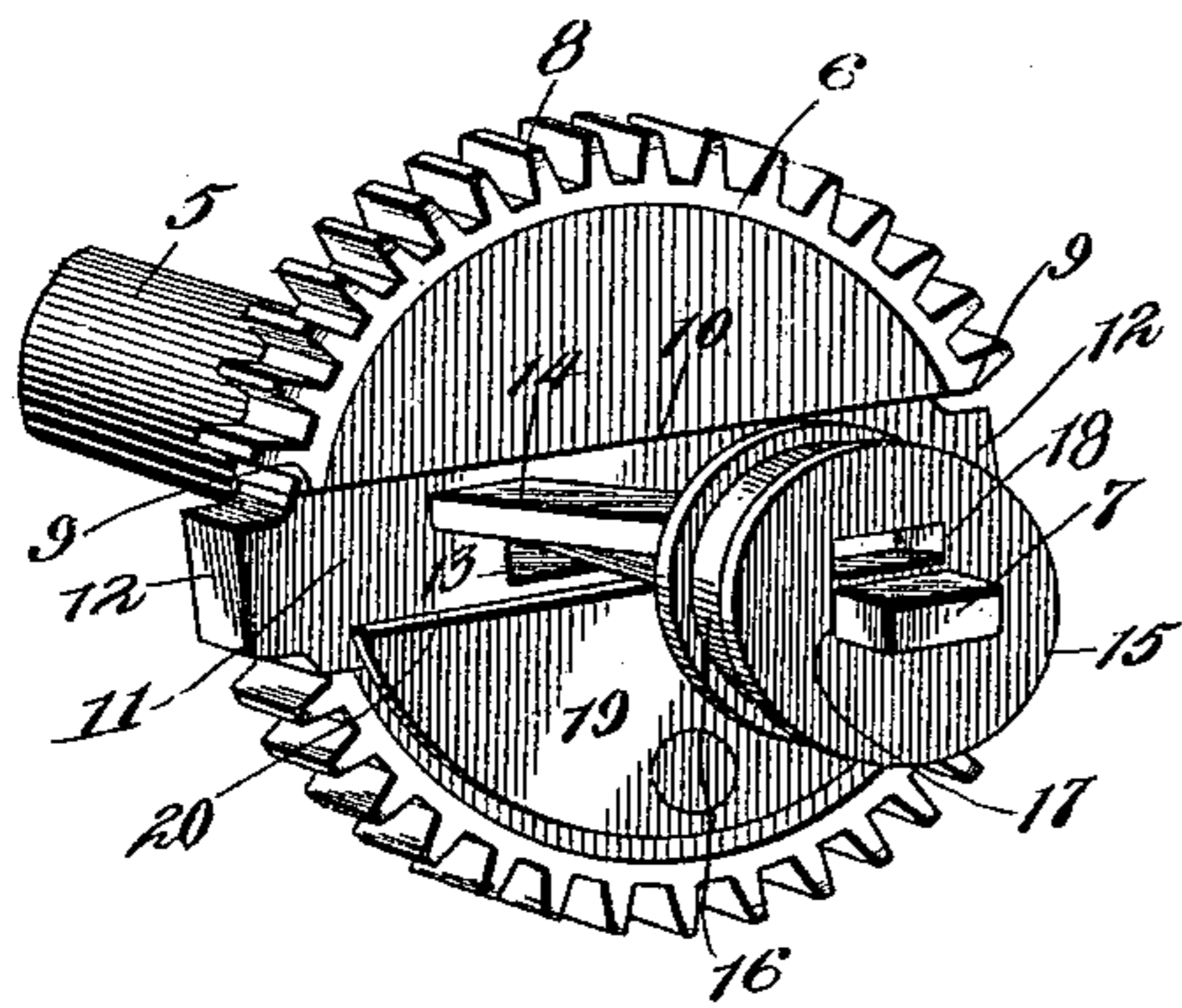
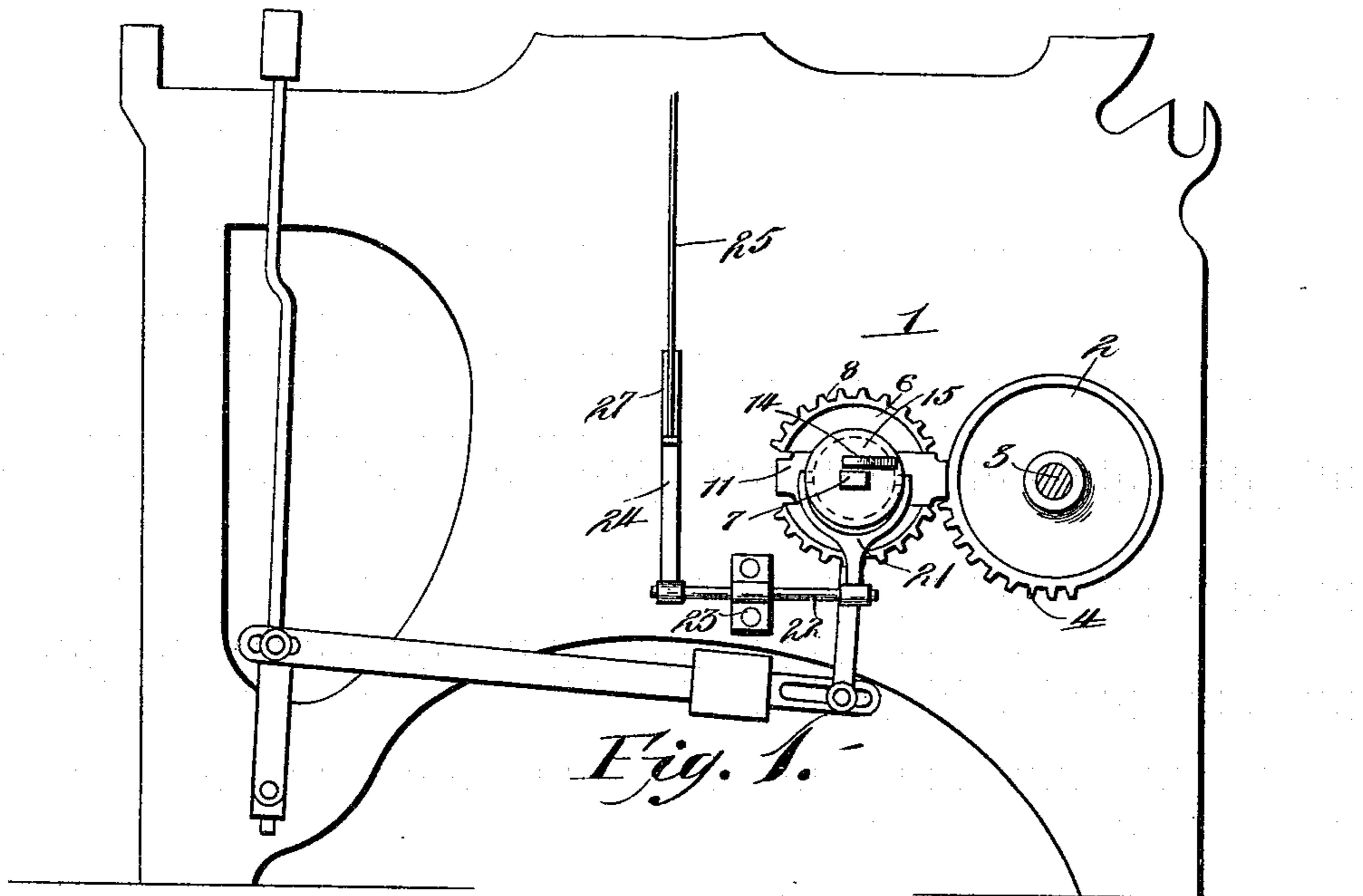


Fig. 2

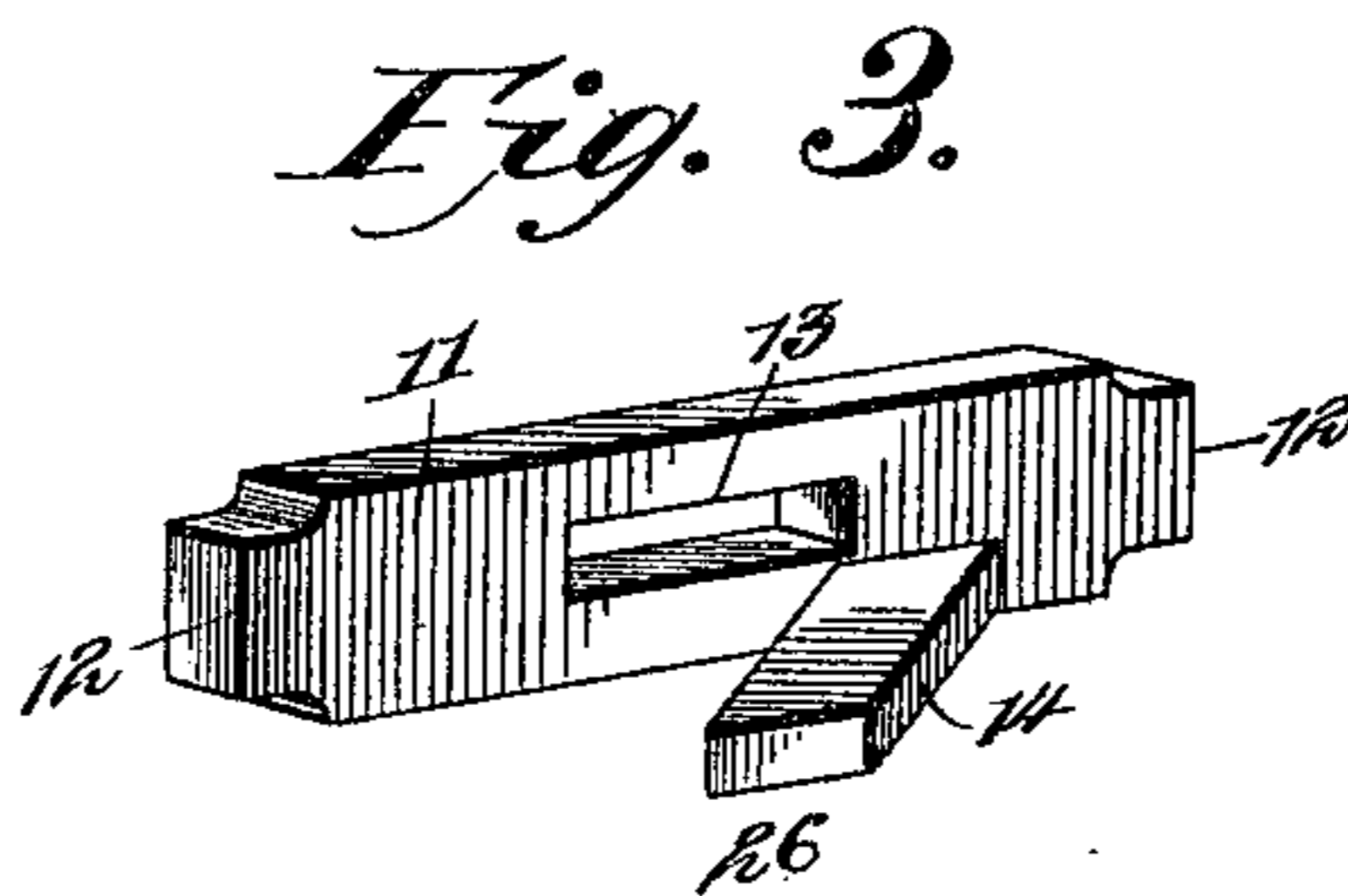
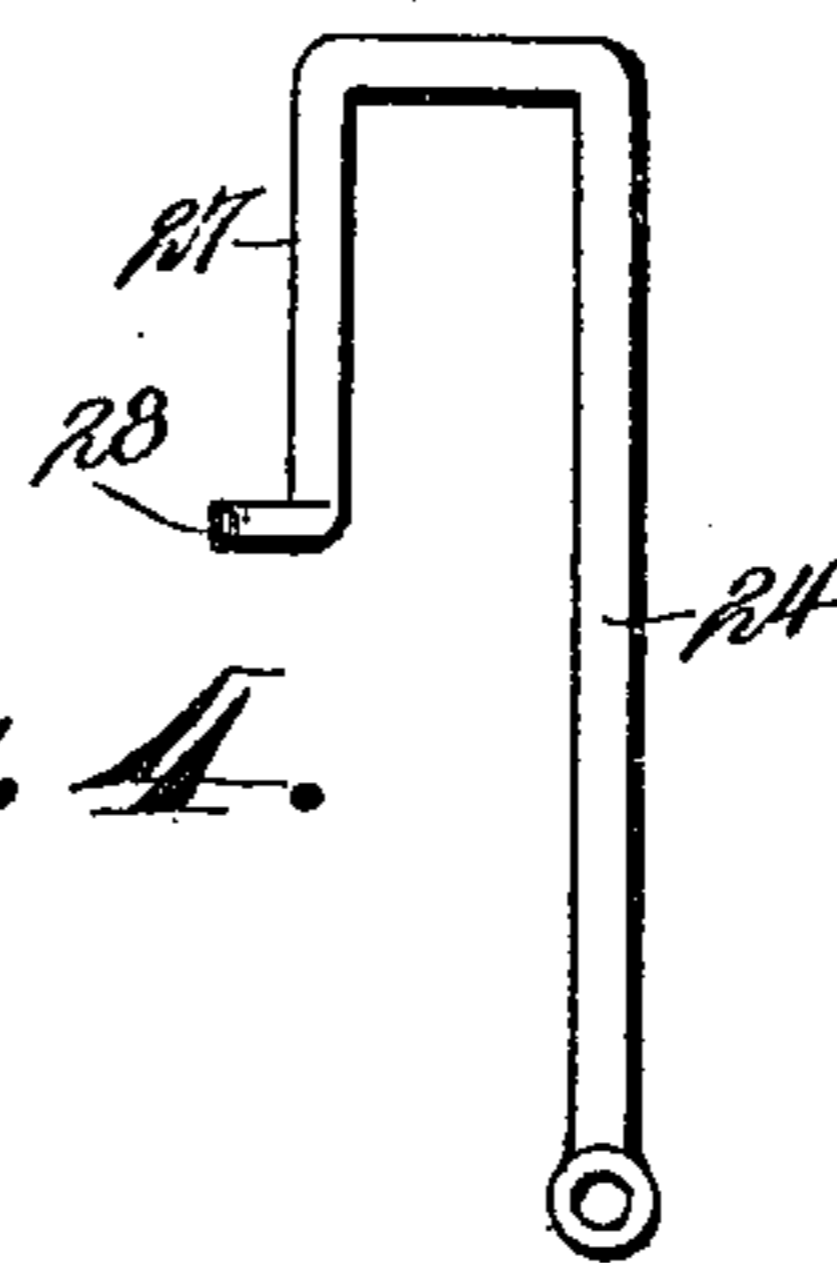


Fig. 4.



Witnesses

Flamenc D. Walker, By His Attorneys,
Chas. S. Hoyer.

J. W. Small. Inventor

Chas. S. Hoyer.

UNITED STATES PATENT OFFICE.

JOHN W. SMALL, OF HAW RIVER, NORTH CAROLINA.

BOX-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 644,692, dated March 6, 1900.

Application filed November 24, 1899. Serial No. 738,214. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. SMALL, a citizen of the United States, residing at Haw River, in the county of Alamance and State of North Carolina, have invented a new and useful Box-Motion for Looms, of which the following is a specification.

This invention relates to box-motions for looms, and is designed principally for operating the shifting or change shuttle-boxes of looms, although capable of being employed in other connections.

The object of the invention is to provide simple and efficient means of the character specified having a more positive and satisfactory operation than devices of a kindred nature and embodying a gear having a movable tooth, which when moved into position, constituting a part of the series of teeth at the periphery of the wheel, or withdrawn from said series acts to cause rotation or non-rotation of the wheel.

With these and other objects in view the invention consists in the construction and arrangement of the several parts, which will be more fully hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of one of the side frames of a loom, showing the improved construction applied thereto in operative relation to an actuating-gear. Fig. 2 is a detail perspective view of the improved device. Fig. 3 is a similar view of the movable or slide tooth. Fig. 4 is a detail view in elevation of a lever adapted to be connected to a pattern-chain lever and also attached to a portion of the operating device of the improved attachment.

Similar numerals of reference are employed to indicate corresponding parts in the several views.

In illustrating the application of the improved device a sufficient number of loom parts have been shown to indicate the mode of applying and the function of the improved mechanism.

The numeral 1 designates a portion of a loom-frame and related to that form of loom employing a chain for obvious reasons and well understood in the art. In this form of loom the organization of parts includes a disk 2, keyed on a shaft 3 and having a smooth or unbroken periphery except at one portion,

where a segmental series of teeth 4 are formed or provided. The improved attachment is directly associated with the disk 2 and includes a stub-shaft 5, having a gear 6 thereon and also provided with an outwardly-extending centrally-located rectangular arm 7. The said arm 7 projects through the center of the gear 6, and at diametrically-opposite points the teeth 8 are mutilated, as at 9, by the formation of a diametric slot 10, in which is movably mounted a slide 11, having the opposite extremities reduced to form abutments 12, which have their outer faces beveled, as clearly shown in Fig. 2. The slide 11 is freely movable across the gear 6 and formed with a slot 13 in the center thereof, through which the arm 7 extends, the said slot being long enough to permit adjustment of the slide equally in opposite directions. At a proper point the slide 11 also has an angularly-disposed working arm 14 projecting outwardly therefrom and of rectangular form in cross-section. This working arm 14 extends partially across the arm 7, and both arms are engaged by a shifting head 15 of circular form and having a circumferential groove 16 in the periphery thereof. A rectangular slot 17 is centrally located in the head 15, through which the arm 7 extends, and to one side of the said slot 17 is another oblique slot 18, through which the arm 14 loosely extends during the operation of the improved device. The working arm 14 controls the movement of the slide 11 by shifting the head 15, and the inward movement of the latter toward the gear 6 will cause the said slide to have the abutment 12 at the right projected, and a reverse operation of the said head will project the abutment 12 at the left. This operation results from the angular position of the said arm 14 and the oblique arrangement of the slot 18, and in its movement the said head is steadied and always retained in the same position relatively to the center of the gear 6 by the arm 7, and the rectangular form of both arms 7 and 14, together with the similarly-shaped slots 16 and 18, prevent lost motion and insure a positive action at all times and a response of the slide to the slightest movement of the head. The slot 13 is of such length that when either end wall contacts with the opposite side edges of the arm 7 the abutments 12 in either instance will be regu-

larly and properly projected, and to hold the slide in accurate working relation to the gear 6 a segmental plate 19 is employed, which has its inner edge 20 extending over or overlapping an adjacent portion of the slide 11.

The head 15 is shifted by a yoke 21, which engages the groove 16 and is attached to a locking-arm 22, bearing in a hanger 23 and also having a crooked lever 24 attached thereto and connected by a rod or analogous device 25 to a pattern-chain lever. (Not shown.) The lever 24, as clearly shown by Fig. 4, is crooked or bent at 26 in a horizontal plane and provided with a depending leg 27, having a terminal eye 28, to which the said rod or analogous device 25 is secured. The shifting devices are so disposed that they will work the head 15 either inward toward or outward from the adjacent face of the gear 6, and the several movements will ensue at such times and by means of attached devices, which will be readily understood by those skilled in the art.

Normally, as will be understood, the smooth unbroken portion of the periphery of the disk 2 is next to the gear 6, and during this time the said disk stands in a position of rest and with the slide 11 in the said gear in the position shown by Fig. 2. When it is desired to communicate a movement of partial rotation to the disk 2 and connected parts and change the position of the shuttle-boxes, the head 15 is caused to move endwise and inwardly on the arm 7, so as to project the abutment 12 on the right, as shown by Fig. 1. Thereupon in the movement of the disk 2 the first tooth of the segmental series 4 strikes against the abutment 12 until the teeth of one of the segments of the gear 6 come into mesh with the teeth 4 of the disk, thus rotating the said gear 6 until the teeth 4 run out, and which will take place when the said gear 6 has about completed a half-revolution or until the blank space made vacant by the slide 11 comes adjacent to the periphery of the disk. It will be understood that this mechanism operates with benefit in a loom wherein two or more shades of weft are employed or two or more grades or numbers of weft of the same color. During the operation of the loom, where the different shades or numbers of weft are laid in the fabric at frequent intervals,

the movements of the shuttle-box controlling the shuttles are regulated by the mechanism set forth.

To accommodate various applications, changes in the form, proportions, and minor details may be resorted to without departing from the principle or sacrificing any of the advantages of the invention.

Having thus described the invention, what is claimed as new is—

1. In a device of the character set forth, the combination with a partially-toothed disk, of an adjacent gear provided with a diametrically-extending slot, a shaft on which said gear is mounted, having a projecting rectangular arm, a slide with terminal abutments movably mounted in the said disk and having an elongated slot through which the arm of the shaft extends and also provided with an angularly-disposed outwardly-extending rectangular working arm, and a head movably mounted on both arms and having slots therein of the same shape and corresponding to the angle of disposition of the said arms.

2. In a device of the character set forth, the combination with a toothed disk of the form set forth, of an adjacently-situated gear having a slide diametrically movable there-through and provided with an angularly-disposed outwardly-extending rectangular working arm, the said slide having opposite abutments and provided with a central elongated slot, a shaft on which the said gear is mounted having a rectangular arm extending therefrom and through the slot in the slide, a head having slots closely arranged therein for the movement therethrough of the said arms and of the same shape as the latter, the slot for the arm projecting from the shaft being in the center of the head and that for the slide-arm being at an angle corresponding to the latter and to one side of the center of the head, and means for shifting the said head inwardly toward or outwardly from the gear carrying the slide.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN W. SMALL.

Witnesses:

CHAS. L. JONES,
W. P. INGLE.