

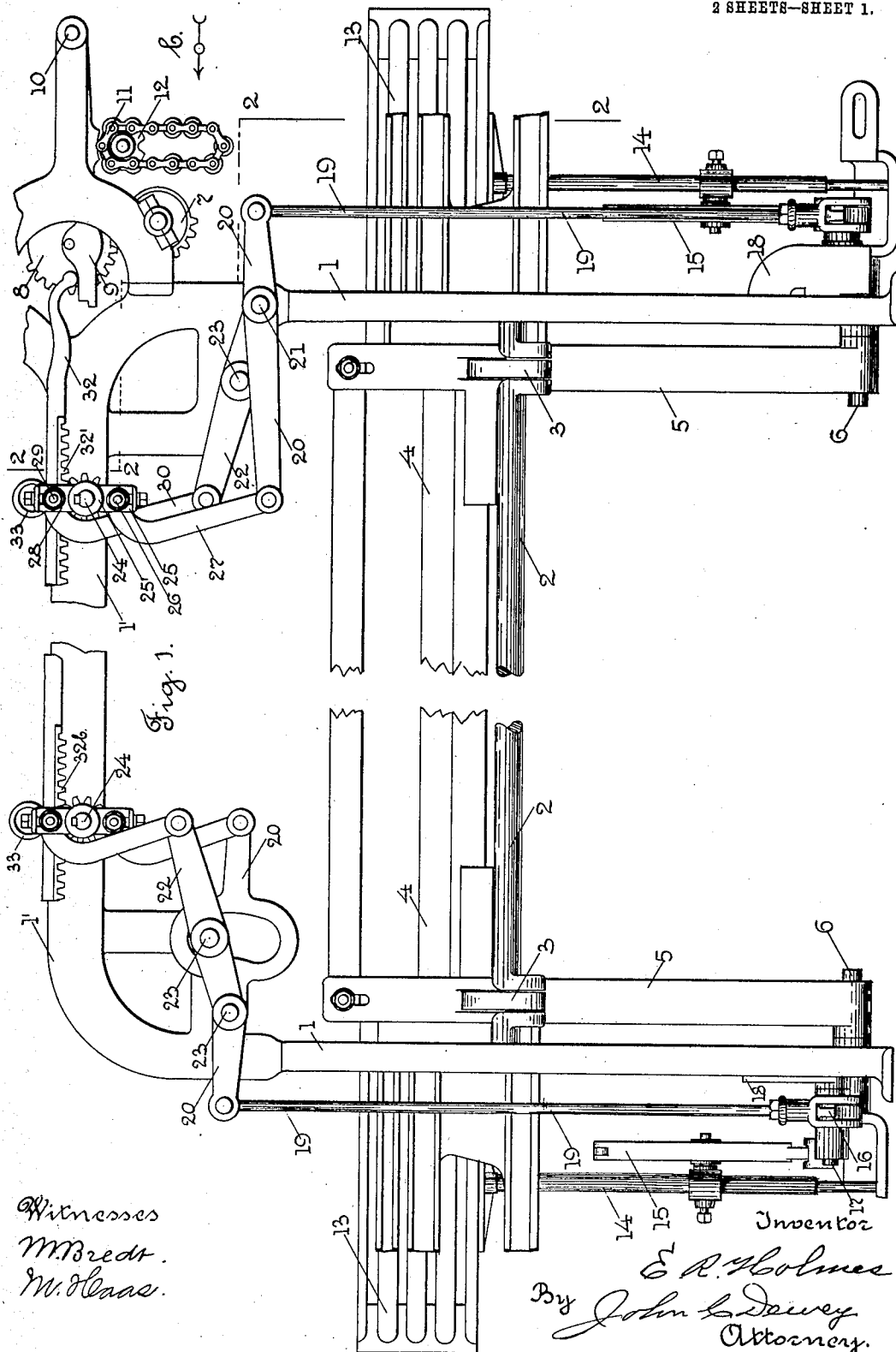
No. 892,727.

PATENTED JULY 7, 1908.

E. R. HOLMES.
SHUTTLE BOX MOTION OF LOOMS.

APPLICATION FILED JULY 13, 1906.

2 SHEETS—SHEET 1.



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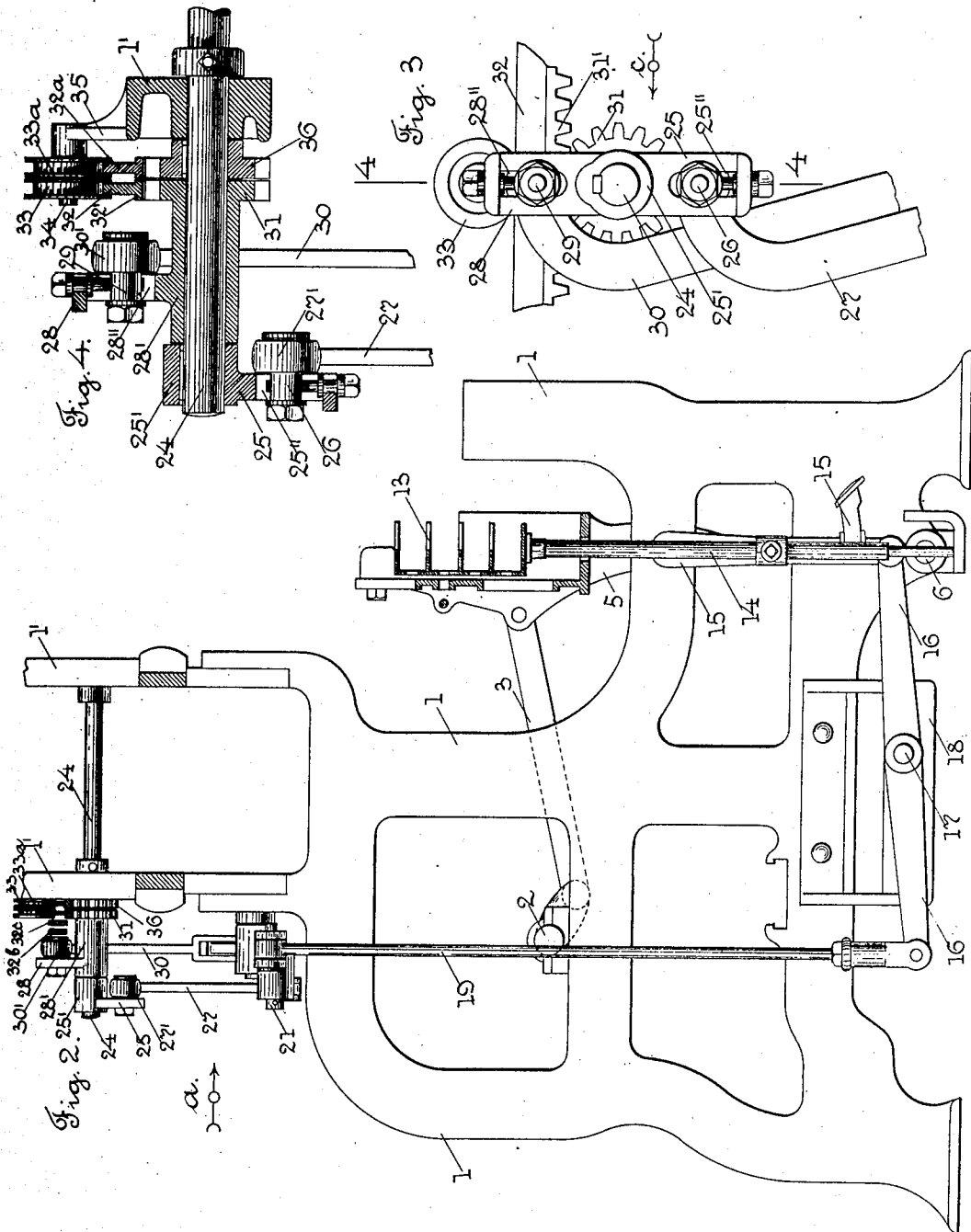
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UNITED STATES PATENT OFFICE.

ELBRIDGE R. HOLMES, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO CROMPTON & KNOWLES LOOM WORKS, A CORPORATION OF MASSACHUSETTS.

SHUTTLE-BOX MOTION OF LOOMS.

No. 892,727.

Specification of Letters Patent.

Patented July 7, 1908.

Application filed July 13, 1905. Serial No. 269,476.

To all whom it may concern:

Be it known that I, ELBRIDGE R. HOLMES, 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 Shuttle-Box Motions of Looms, of which the following is a specification.

My invention relates to improvements in looms, and more particularly to improvements in shuttle box motion of looms of the class which have two or more shifting or drop shuttle boxes at one or both ends of the loom.

The object of my invention is to provide an improved construction of the connections, intermediate the pattern surface, which indicates for the movement of the shuttle box rod, and the shuttle boxes, and particularly the construction of the connections shown and described in U. S. Letters Patent, No. 787,448, in which, in each set of connections, intermediate the pattern indicator lever and the vertically moving shuttle box rod, there are two cranks to obtain a double crank motion, each crank at each movement thereof moving through an arc of substantially one hundred and eighty degrees.

In my improvements, I preferably locate the second crank in the connections intermediate the pattern indicator lever and the vertically moving shuttle box rod, at the upper rear part of the loom, and preferably at the rear of the loom arch, and I provide a vibrator connector with teeth thereon, adapted to mesh with and rotate a pinion, which in turn acts to operate a crank, and through intermediate connections from said crank to the shuttle box rod, operates the shuttle box rod and the shuttle boxes supported thereon, according to the indications of the pattern surface.

I have only shown in the drawings sufficient parts of a loom with my improvements in shuttle box motion combined therewith, to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings:—Figure 1 is a rear view of a loom frame, and some parts of the loom thereon, and of a shuttle box motion embodying my improvements, looking in the direction of arrow *a*, Fig. 2. Fig. 2 is a section, on line 2, 2, Fig. 1, looking in the direction of arrow *b*, same figure. Fig. 3 is a detached view, on an enlarged scale, of the cranks and other parts shown at the right in

Fig. 2 and, Fig. 4 is a vertical cross section, on line 4, 4, Fig. 3, looking in the direction of arrow *c*, same figure.

In the accompanying drawings, 1 are the loom sides or frames, 2 is the crank shaft, 3 the crank connectors to the lay 4, which is carried on the lay-swords 5, which are pivotally mounted at their lower ends on studs 6.

At one end of the loom, at the upper part thereof, in this instance the right hand end, is located the pattern mechanism controlling the movement of the shuttle boxes, said pattern mechanism may be of any ordinary and well known construction, and in this instance is of the well known Knowles type, shown and described in U. S. reissue Letters Patent, No. 7,784, of July 3, 1877.

In the drawings, I have only shown the lower cylinder gear 7, the vibrator gear 8, pivotally mounted on the vibrator lever 9 which is pivotally supported at its outer end on a rod 10 which extends over the pattern surface 11 carried on the pattern cylinder 12, and made of rolls and tubes in the ordinary way. I have shown in this instance four shifting or drop shuttle boxes 13 at each end of the loom, supported on the upper end of a vertically moving rod 14, which is connected with a give-way connection 15 pivotally connected at its lower end with one end of a lever 16, centrally pivoted on a stud 17 and secured to a stand 18 bolted to the loom side 1. The other end of the lever 16 is pivotally connected to the lower end of the vertically moving connector or rod 19. The upper end of said rod 19 is pivotally connected to a lever 20, pivoted on a stud 21 carried on one end of a lever 22, pivotally supported on a stand 23. The levers 22 and 20 together form a compound lever, of ordinary construction and operation, for moving the four shuttle boxes into four different positions relatively to the race-way of the lay, through the indications of the pattern surface, in the usual and well known way.

All of the above parts may be of the ordinary construction and operation now in use in looms.

I will now describe my improvements, which as above stated relate particularly to the connections intermediate the pattern indicator lever and the shuttle box rod, said connections having two cranks therein.

A shaft 24 extends transversely between the arches 1', and is mounted in suitable

bearings on the arches. The shaft 24 extends beyond the rear arch 1', as shown in Fig. 4, and has splined thereon at its outer end the hub 25' of a crank 25. The crank 25 has a slot 25'' therein, see Fig. 4, through which extends a crank pin 26 adjustable in the slot 25'', and having pivotally mounted thereon the hub 27' of the crank connector 27, to the lever 20.

On the extended end of the shaft 24, which is inside of the hub 25' of the crank 25, is loosely mounted the hub 28' of a crank 28, having an opening 28'' therein for the crank pin 29, which is adjustably mounted in said opening, and has loosely mounted thereon the hub 30' of the crank connector 30 to the lever 22.

The hub 28' has fast on its inner end, in this instance made integral therewith, a pinion 31, which meshes with the teeth or rack surface 32' on the vibrator connector 32, pivotally attached to the vibrator gear 8.

A grooved roll 33, mounted on a stud 34 secured in a stand 35 extending up from the rear arch 1', see Fig. 4, extends over the upper side of the vibrator connector 32, and holds the same in engagement with the pinion 31.

Fast on the extended end of the shaft 24, just inside of the pinion 31, is a second pinion 36, which meshes with a second vibrator connector 32^a located on the inside of the vibrator connector 32. A second grooved roll 33^a extends over the upper side of the vibrator connector 32^a and holds the same in engagement with the pinion 36.

In addition to the two vibrator connectors 32 and 32^a, are two other vibrator connectors 32^b and 32^c, see Fig. 2, which extend across the loom, at the rear of the arch, as shown in Fig. 1, so that the same pattern mechanism will operate both sets of shuttle boxes from one end of the loom. The vibrator connectors 32^b and 32^c have teeth or rack surfaces to engage and operate two pinions, and through said pinions, two cranks, shown at the left in Fig. 1, and through said cranks and connections to the shuttle boxes, operate the shuttle box rod and the shuttle boxes supported thereon.

The construction of the crank mechanism shown at the left in Fig. 1, and of the connections intermediate the same and the shuttle boxes, is the same as that already described, and therefore it is not necessary to describe the same. The same figures of reference are used for the parts shown at the left in Fig. 1, similar to the parts shown at the right in said figure.

In the operation of the loom, the movement of the pattern cylinder 12 carrying the pattern chain, will move one of the vibrator levers 9 to bring a vibrator gear 8 into engagement with the upper or lower rotating cylinder gear, in the usual and well known

way; the rotary motion of a vibrator gear will communicate longitudinal motion to a vibrator connector, and, through the teeth thereon meshing with the pinion, will rotate said pinion and the crank loose on the shaft 24, or the crank fast on said shaft, through an arc of substantially one hundred and eighty degrees, and through the crank connector to the compound box lever, will raise or lower the vertically moving box rod and the boxes thereon, to the desired position relative to the race-way of the lay, according to the indications of the pattern surface, in the ordinary and well known way.

It will be understood that the details of construction of my improvements may be varied if desired, and in case of only two shuttle boxes at one or both ends of the loom, a plain box lever, and one crank connected therewith, intermediate said box lever and the vibrator gear, will be used.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a shuttle box motion, the combination with vibrator levers, vibrator gears pivotally mounted thereon, and vibrator connectors attached to said gears and having teeth thereon, of a shaft, a pinion fast on said shaft and meshing with one of said vibrator connectors, and a crank fast on said shaft, and connections intermediate said crank and the shuttle boxes, and a hub loosely mounted on said shaft, a pinion on said hub meshing with the vibrator connectors, and a crank on said hub, and connections intermediate said crank and the shuttle boxes.

2. In a shuttle box motion, the combination with vibrator levers, vibrator gears pivotally mounted thereon, and vibrator connectors attached to said gears and having teeth thereon, of a shaft extending transversely between the arches, a pinion on said shaft and meshing with one of said vibrator connectors, and a crank fast on said shaft, and connections intermediate said crank and the shuttle boxes, and a hub loosely mounted on said shaft, a pinion on said hub meshing with a vibrator connector, and a crank on said hub, and connections intermediate said crank and the shuttle boxes.

3. In a shuttle box motion, a connector pivotally attached to a vibrator gear and said gear, and said connector extending across the loom to the opposite end thereof, and having teeth thereon to engage and operate a pinion and said pinion, and through said pinion to communicate movement to a crank, and said crank, and connections therefrom to the shuttle boxes.

E. R. HOLMES.

Witnesses:

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