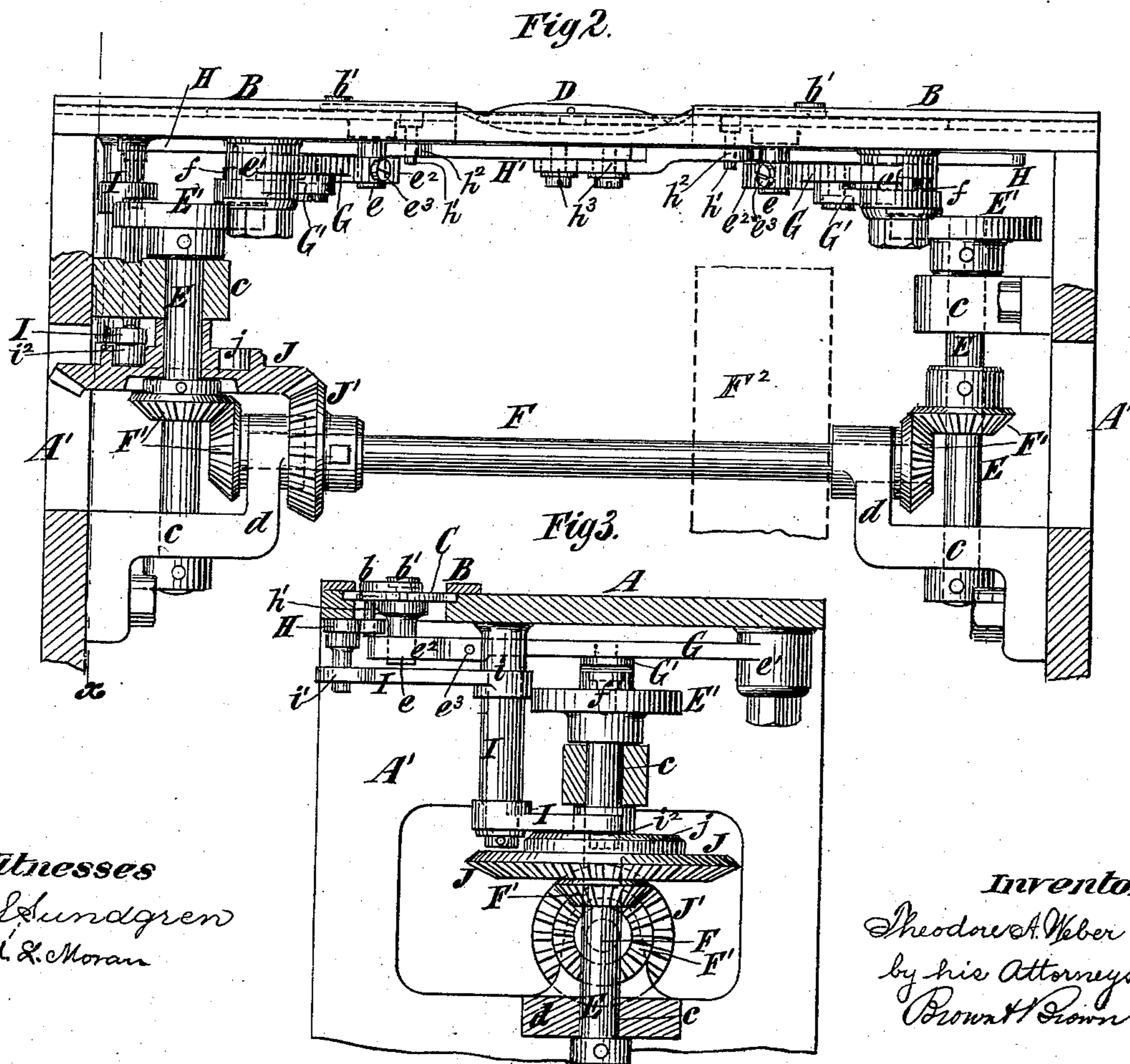
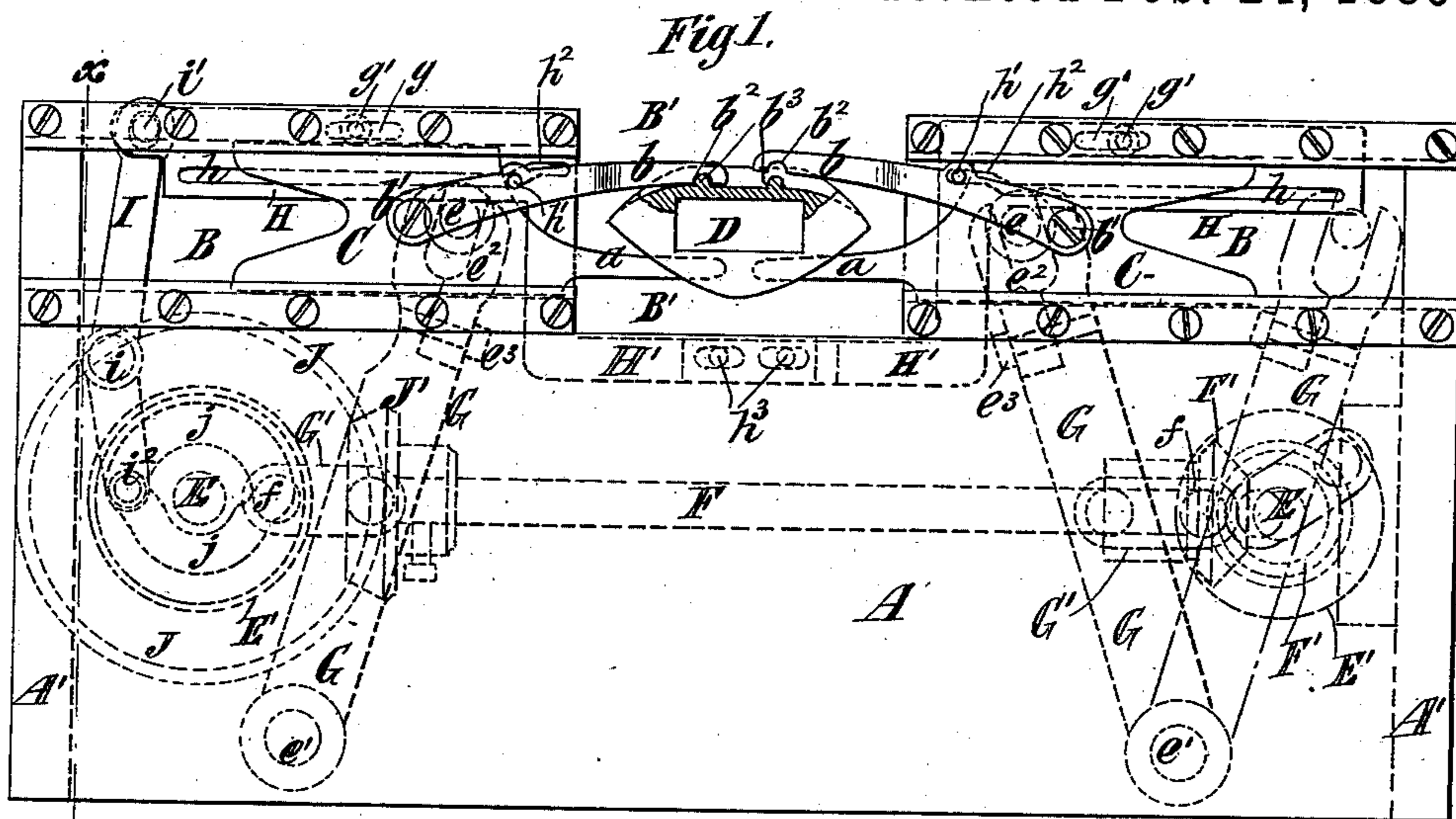


(No Model.)

T. A. WEBER.  
SHUTTLE MOTION FOR LOOMS.

No. 312,680.

Patented Feb. 24, 1885.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## SHUTTLE-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 312,680, dated February 24, 1885.

Application filed September 3, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, THEODORE A. WEBER, of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Shuttle-Motions for Looms, of which the following is a specification.

Although my invention may be embodied in looms of various kinds, it is especially intended for use in what are known as "narrow-ware" looms for weaving narrow fabrics.

The invention relates to that class of looms in which are employed shuttle-carriers having hinged sides, which are arranged to reciprocate in raceways on opposite sides of the loom and to advance into the warp in opposite directions, one of which shuttle-carriers carries the shuttle partly through the warp and delivers it to the other carrier, which, as it retires, takes the shuttle the remaining distance through the warp.

The invention consists in a novel and simple combination of mechanism, hereinafter described, for reciprocating the shuttle-carriers, whereby there is obtained at the end of the movement of the shuttle-carriers outward or away from each other a dwell of sufficient duration to enable the lay to beat up and retire.

The invention also consists in a novel combination of mechanism, particularly hereinafter described, for operating the hinged sides of the shuttle-carriers, to engage them with and to disengage them from their shuttle.

In the accompanying drawings, Figure 1 is a plan of a portion of a loom embodying my invention. Fig. 2 is a sectional elevation thereof; and Fig. 3 is a transverse vertical section on the plane of the dotted line *xx*, Figs. 1 and 2.

Similar letters of reference designate corresponding parts in all the figures.

A designates the top plate of the loom, and A' are the end frames supporting the same.

B designates the raceways, arranged in line, and having between them an opening, B', for the shed and the beating up of the lay. In these raceways are shuttle-carriers C, capable of being reciprocated therein simultaneously toward and from each other and serving to

carry the shuttle D through the warp. Each shuttle-carrier C has jaws *a b*, which grasp the shuttle between them. The jaws or sides *a* are rigid, but the jaws or sides *b* are hinged at *b'*, so that they may swing or move toward and from the shuttle, to cause notches *b<sup>2</sup>* in them to engage with or release projections *b<sup>3</sup>* on the shuttle D.

Turning now to the means for operating the shuttle-carriers C, E E designate vertical shafts supported in bearings *c*, and receiving rotary motion from a main shaft, F, by bevel-wheels F'. The main shaft may be rotated by a belt over a pulley, F<sup>2</sup>, partly shown in dotted outline in Fig. 2, and said shaft has its bearings in brackets *d*, which also contain the lower bearings, *c*, for the shafts E.

On the under sides of the shuttle-carriers C are downwardly-projecting studs *e*; and G designates levers which are fulcrumed at *e'* at one end, so as to swing in a horizontal plane, and at the other ends of which are forks *e<sup>2</sup>*, embracing the studs or pins *e*. One side of each fork is made separate from the lever, and may be tightened by a screw, *e<sup>3</sup>*, to take up wear between the stud and its embracing-fork.

On the upper end of each vertical shaft E is a crank, E', and the crank-pin *f* of each crank is connected by a link or connecting-rod, G', with the corresponding lever, G, between its ends. The lever G, at the right-hand end of Fig. 1, is shown dotted in two positions, in order to more clearly illustrate its movements. The peculiarity in the connecting-rod is that its length is less than the throw or stroke of the crank, and but very little more than the length of the crank from the center of the shaft E to the center of the crank-pin *f*. The result of this particular length of crank is that at the outer end of the movement of the shuttle-carrier C a dwell of considerable length will be afforded, giving the lay ample opportunity to beat up and retire.

I do not claim, broadly, as of my invention the combination of a lever, a crank, and a connecting-rod for operating the shuttle-carrier, and desire to cover such combination only when the connecting-rod is of substantially the dimension stated.

I will now describe the mechanism whereby the hinged sides *b* of the shuttle-carriers are engaged with and disengaged from the shuttle D; but I would here remark that by the term  
 5 "hinged sides," as herein used, I desire to cover movable sides, whether they are hinged by pivots, as shown, or are hinged by flexible portions or springs.

On the under side of the table or top plate, 10 A, is a frame or plate, H, which is adapted to slide for a short distance horizontally, and which is guided by slots *g* in it fitting studs *g'* on the top plate, A, as shown dotted in Fig. 1.

The frame or plate H comprises two straight 15 portions, H, which are adjacent to the raceways B, and a connecting yoke or portion, H', which connects said straight portions, and is out of line with them, so as to leave clear the opening or space B' for the movement of the lay and shed. In the straight portions of the 20 frame or plate H are slots *h*, which receive pins *h'*, projecting downward from the hinged sides *b* of the shuttle-carriers C, and at the ends of these slots are cam-like portions or continuations *h*<sup>2</sup> thereof.

In order that the pins *h'* on the sides *b* of the shuttle-carriers C shall stand in proper relation to the cam-like portions *h*<sup>2</sup> of the slots at the end of the inward movement of the shuttle-carriers, or when they are nearest together, 30 I divide the yoke H' of the plate H and connect the two portions by bolts and slots *h*<sup>3</sup>, as shown in Figs. 1 and 2. The two portions of said plate or frame H may then be adjusted 35 and held securely in proper relative position.

In order to release the hinged sides *b* of the shuttle-carriers from the shuttle, I move the plate or frame H slightly in the direction of the movement of the shuttle-carrier, and 40 thus cause the cam-like slot portions *h*<sup>2</sup> to act on the pins *h'*; and thus to move the hinged side of one shuttle-carrier into engagement with the shuttle, and remove the hinged side of the other shuttle-carrier from the shuttle. 45 In the present example of my invention I effect this movement in the following manner:

I designates a lever fulcrumed at *i*, and connected at one end, *i'*, with the left-hand end of the plate or frame H. At its opposite end this 50 lever carries a roller or bowl, *i*<sup>2</sup>.

The lever I here shown consists of a rock-shaft and two arms, as shown in Fig. 3.

On the upright shaft E, at the left-hand end of the loom, Figs. 1 and 2, is loosely mounted 55 a bevel-wheel, J; and J' designates a bevel-pinion fixed on the main shaft F, and imparting to the wheel J a rotary motion independent of the shaft E. In the upper side of the wheel J is a cam course or groove, *j*, in which fits the 60 roller or bowl *i*<sup>2</sup> on the lever I.

The wheel J and pinion J' are of such size that the wheel J only makes one revolution to each two revolutions of the shaft E. The effect of this combination is that at the termination of each inward movement of the shuttle-carriers C, and when they are in the position 65 shown in Fig. 1, the plate or frame H is moved slightly, and the hinged side *b* of one carrier is moved away from the shuttle D, while that of the other carrier is moved toward and engaged 70 with the shuttle, and the shuttle is thus grasped alternately by each carrier and released from the other carrier.

What I claim as my invention, and desire to secure by Letters Patent, is— 75

1. The combination, with a shuttle-carrier, C, of a lever, G, fulcrumed at one end, *e'*, and connected at the other end with the carrier, a crank, E', and means for rotating it, and a connecting-rod, G', the length of which is less than 80 the throw or stroke of the crank, and which forms a direct and inflexible connection between the crank-pin and said lever G between its ends, substantially as herein described.

2. The combination, with the forked shuttle-carriers C, each having a hinged side, *b*, 85 provided with a pin, *h'*, and mechanism for reciprocating said carriers, of the plate or frame H, arranged approximately parallel with the line of movement of said shuttle-carriers, and provided with cam-slots *h h*<sup>2</sup>, receiving the pins *h'*, means for reciprocating said 90 plate or frame to alternately engage and release the hinged sides of said shuttle-carriers with and from a shuttle, and guides for said reciprocating plate or frame, substantially as herein described. 95

3. The combination, with the forked shuttle-carriers C, each having a hinged side, *b*, provided with a pin, *h'*, and mechanism for reciprocating said carriers, of the plate or frame 100 H, arranged approximately parallel with the line of movement of said shuttle-carriers, and provided with cam-slots *h h*<sup>2</sup>, receiving the pins *h'*, the lever I, connected at one end with the 105 said plate or frame, the cam and wheel J, for acting on the other end of said lever, means for rotating said cam and wheel, and thereby reciprocating said plate or frame, to alternately engage and release the hinged sides of said 110 shuttle-carriers with and from a shuttle, and guides for said reciprocating plate or frame, substantially as herein described.

THEODORE A. WEBER.

Witnesses:

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 CHRISTIAN WEBER.