

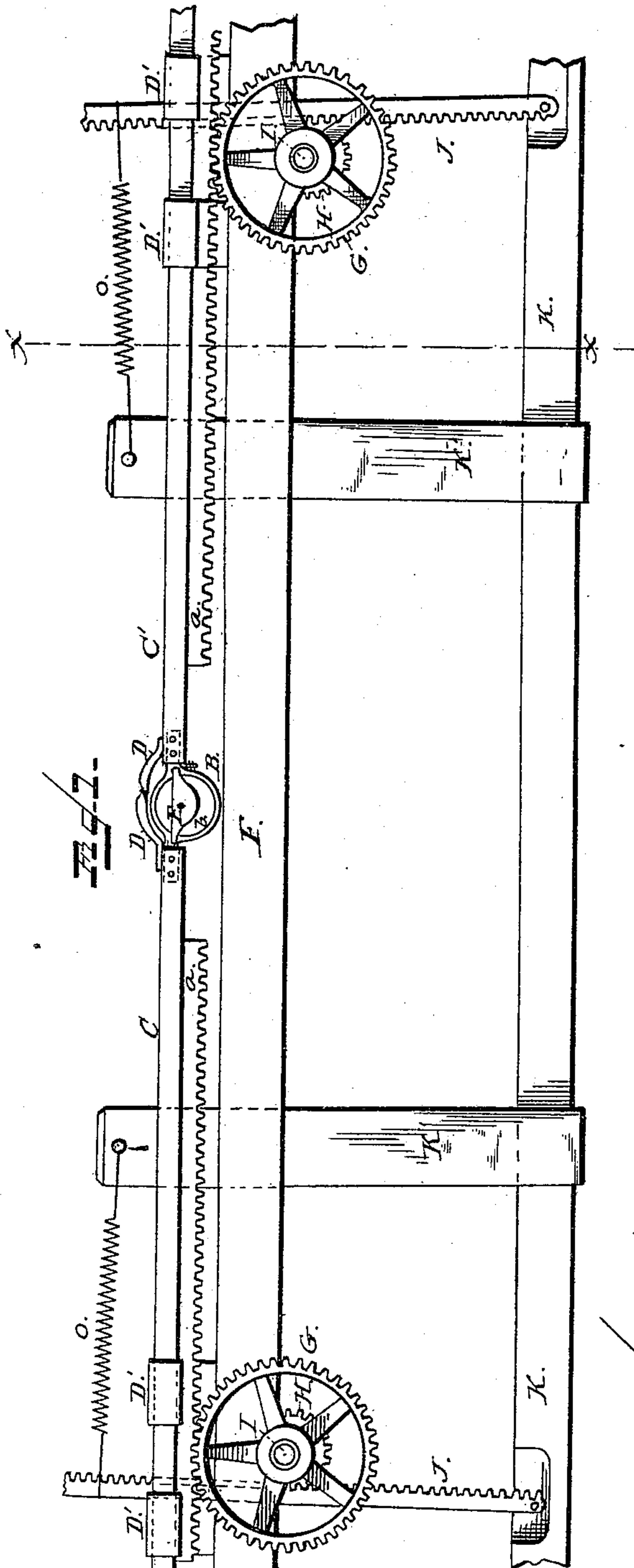
(No Model.)

W. F. HITCHCOCK.

POSITIVE SHUTTLE MOTION FOR LOOMS.

No. 395,829.

Patented Jan. 8, 1889.



WITNESSES:

*Callace Just*  
*F. A. Martin*

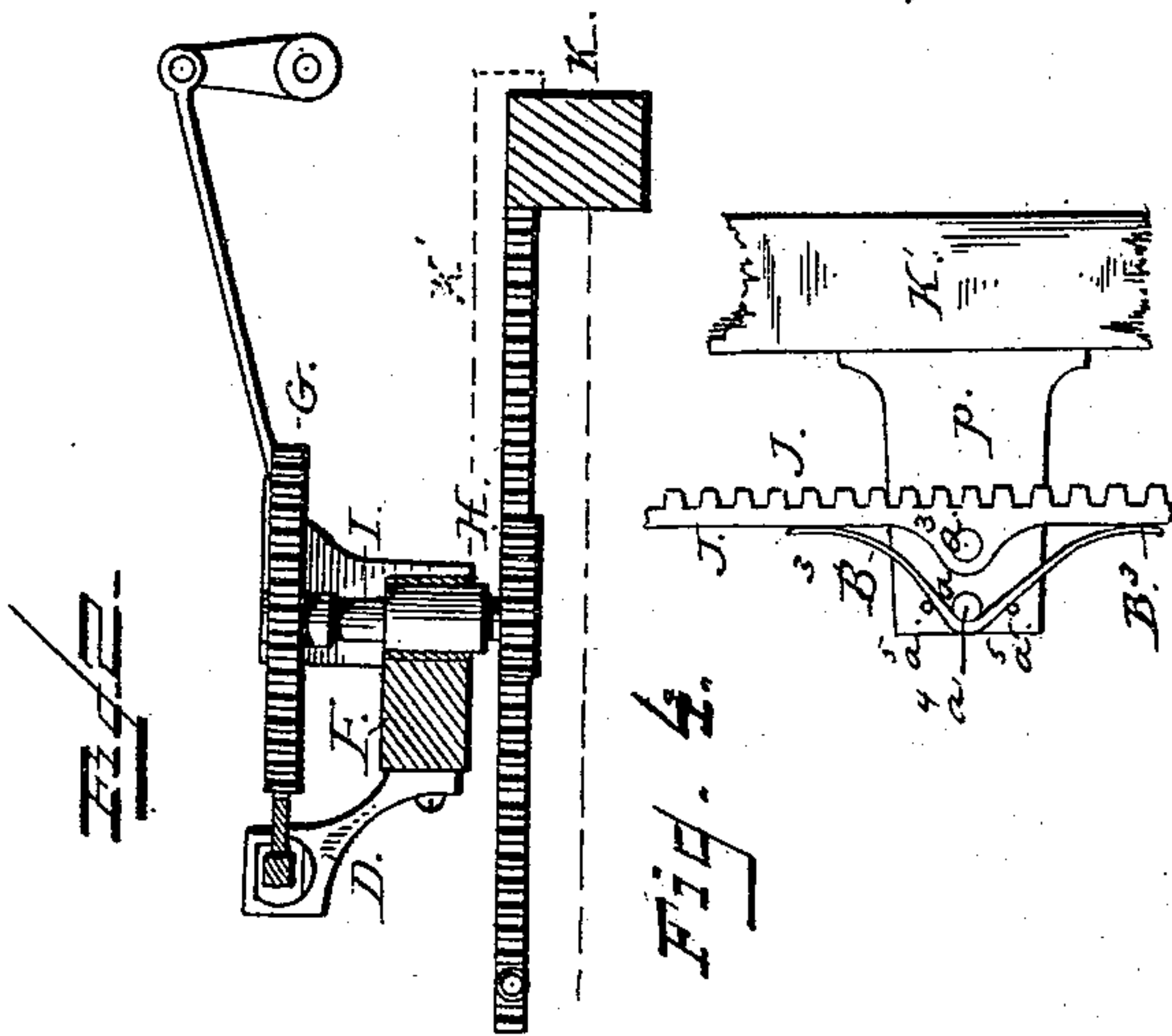
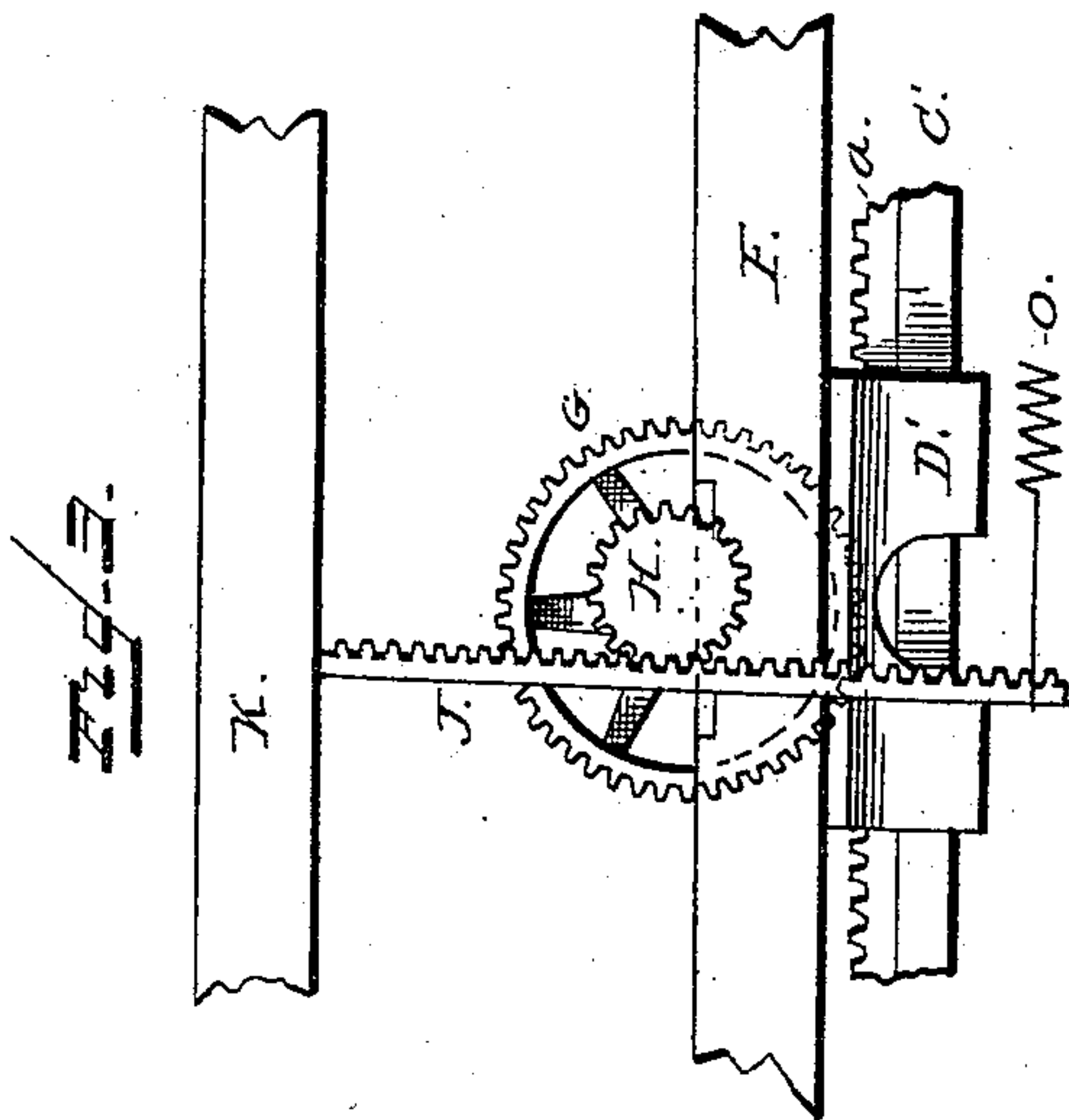
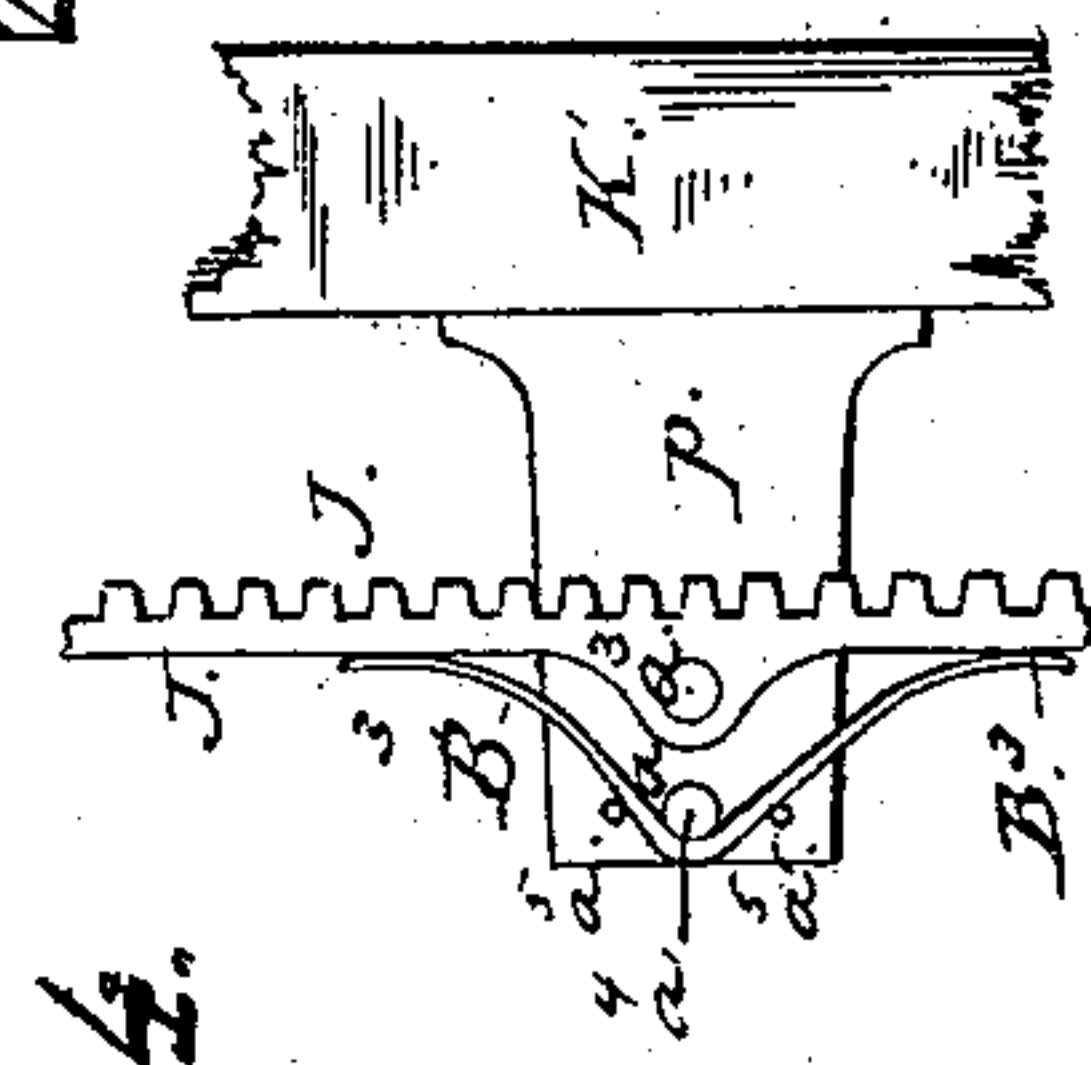


Fig. 4.



INVENTOR:

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# UNITED STATES PATENT OFFICE.

WILLIAM F. HITCHCOCK, OF HOMER, NEW YORK.

## POSITIVE SHUTTLE-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 395,829, dated January 8, 1889.

Application filed January 28, 1888. Serial No. 262,283. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM F. HITCHCOCK, a citizen of the United States, residing at Homer, in the county of Cortland and State of New York, have invented a new and useful Improvement in Positive Shuttle-Motions for Looms, of which the following is a specification.

My invention relates to an improvement in mechanism for operating the shuttle-carriers of a loom from the movement of the lay.

In the arrangement for the movement of the carriers I secure to each of the tubular carriers a toothed rack and to the lay of the loom I journal a shaft which carries two toothed wheels, one being at the upper end of said shaft and the other at the lower end of the same. The upper of the two, which is concentric to its axis, is arranged to mesh with the teeth of the rack on the carrier. The lower one is fixed to the shaft eccentrically, and its teeth mesh with the teeth of a short rack pivoted to a beam of the loom at one end, the other end being connected by a spiral spring to an arm extending from said beam. By means of the eccentric gear-wheel variable—i. e., rapid and slow—motion is given to the upper gear-wheel and the carrier, as the shuttle is distant or near to the point where the change is made from one carrier to the other.

The shuttles to be used with these carriers have pointed ends provided with recesses, after the manner of those seen in patent to Rumsey, No. 340,523, and the carriers have pivoted at their ends holding and releasing latches adapted to take into the said recesses or slots of the said shuttle ends. The carriers are made to approach and recede from each other, one or the other always carrying the shuttle. The latches of the carriers are so formed at their free ends that the one holding the shuttle will be unlocked from one shuttle end by the other latch simultaneously with the locking of the latter with the opposite end of the shuttle.

It is to be understood that the gear arrangements are the same on both sides of the loom, so that a description of one side will answer for that of the other side.

In my drawings, Figure 1 is a top or plan view of parts of a loom, showing the complete

arrangements for the carriers and the operating parts for the same. Fig. 2 is a transverse sectional view on line *x x* of Fig. 1. Fig. 3 is a bottom view in part, showing the under side of the eccentric gear-wheel and co-operating parts. Fig. 4 is a plan showing a modification of the rack J.

Similar reference-letters indicate like parts in all of the figures.

Referring to the drawings, C C' are the shuttle-carriers, provided with holding-catches D D and racks *a a*.

D' D' are the guides for the carriers.

F is the lay or beater, and to it are journaled shafts I I, to which are secured eccentric gear-wheels H H and concentric pinions G G. The pinions G are adapted to mesh with the racks *a*, and the wheels H engage lateral racks J J, pivoted to a transverse beam, K, of the frame of the loom. Brackets K' extend from the beam K, and to the ends of these are connected yielding the racks J J by spiral springs O O.

When reciprocating motion is given to the lay or beater F, the racks J J are traversed by the wheels H on the shafts I, and the motion of the said shafts is communicated to the pinion G, and through the racks *a* to the carriers C C'. In carrying the shuttle through the warp it is important that variable motion be given to the carriers, so that a slow movement may be had when the shuttle is in the act of changing from one carrier-arm to the other; then rapid motion while receding from the cloth; then, again, slow motion during the last part of the movement, and again continuing slow in the reaction while entering the warp; then accelerating and again retarding. In order to properly effect this variable motion the eccentric gear-wheels H are employed, and they are so adjusted that when the carrier-arms are entirely removed from the cloth they (the said wheels) will be in contact with the racks J at their points of greatest radius to effect the slowest movement required to the carriers. Now, as the lay recedes from its beat, the wheels H revolve, gradually increasing their movement, until the points of shortest radius are reached to effect the most rapid motion possible; then again gradually slowing to the radial point of slowest movement and greatest power at the time of making the

exchange from one carrier to the other. The sizes of the gear-wheels H are such that they receive each a complete revolution during the forward movement of the lay, and also a corresponding complete revolution during the backward movement of the same. The relation between the diameters of the wheels H and pinions G is such that the shuttle may be carried half through the warp and out again from either side of the beater (the racks on the carriers being arranged with this object in view) at each reciprocation of the beater.

In the modification shown in Fig. 4, K' is the bracket. *p* is a post attached thereto. *a*<sup>3</sup> is a pivot or axis for the rack. B<sup>3</sup> is the strap-spring, confined between pins *a*<sup>5</sup> *a*<sup>5</sup> *a*<sup>4</sup>, and bearing by its ends upon or against the back edges of the rack J.

It will be readily understood that the rack will be kept in mesh with its engaging wheel by the pressure of the spring B<sup>3</sup>, which accom-

modates itself to the variable movement of the eccentric wheel H. (Shown in Figs. 1 and 2.)

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

1. The combination, with the shuttle-carriers and the toothed racks thereto fixed, gear-wheels adapted to engage the fixed racks and the racks on the carriers, and the lay, of the loom-frame and racks pivoted thereto, as and for the purpose specified.

2. The combination, with the shuttle-carriers and toothed racks thereto fixed, the lay, and the eccentric and concentric gear-wheels, combined as described, of the operating-racks and the loom-frame, as and for the purpose set forth.

W. F. HITCHCOCK.

Witnesses:

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A. P. HENDERSON.