(No Model.) 3 Sheets—Sheet 1.

C. H. KNOWLTON & B. F. MEYER.

LOOM PICKING MECHANISM.

No. 306,260. Patented Oct. 7, 1884.

FIG. 1.

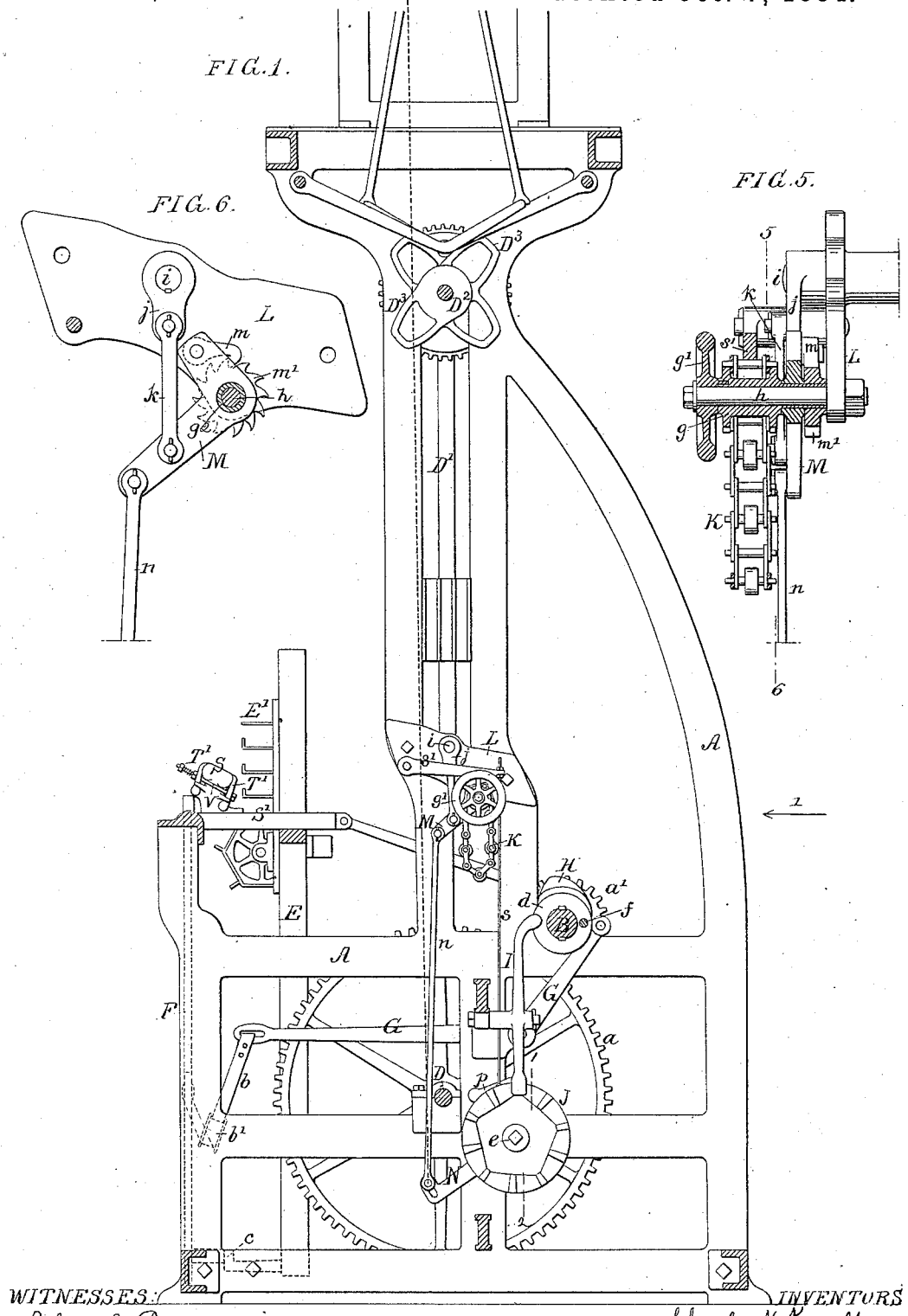

FIG. 6.

FIG. 5.

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FIG. 2

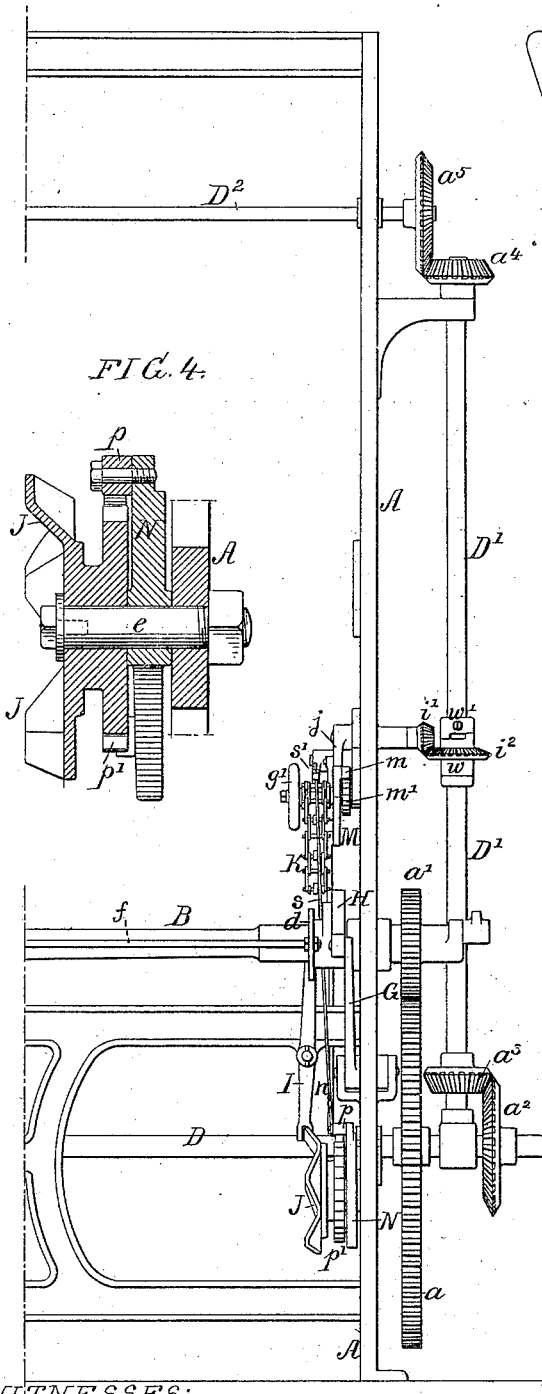

FIG. 4.

FIG. 3.

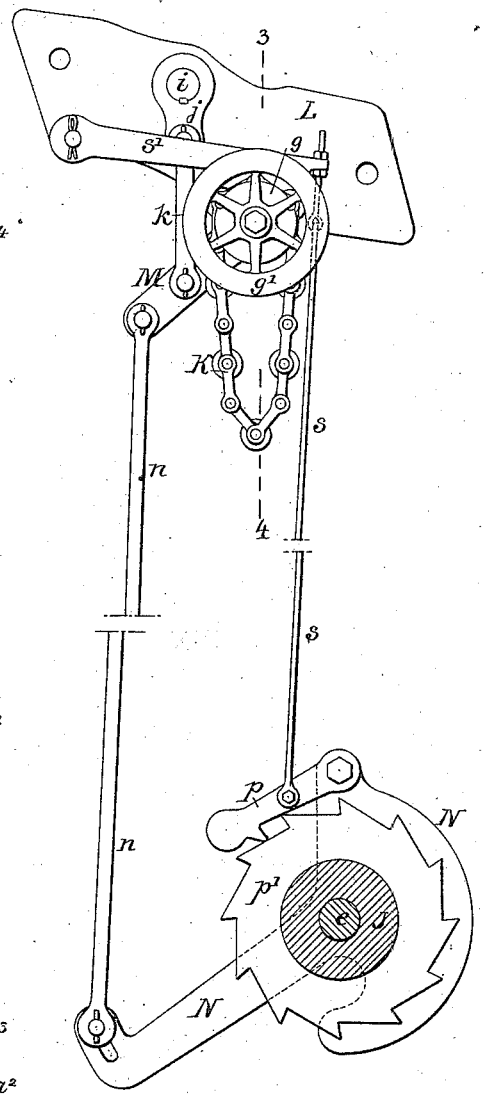

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FIG. 7.

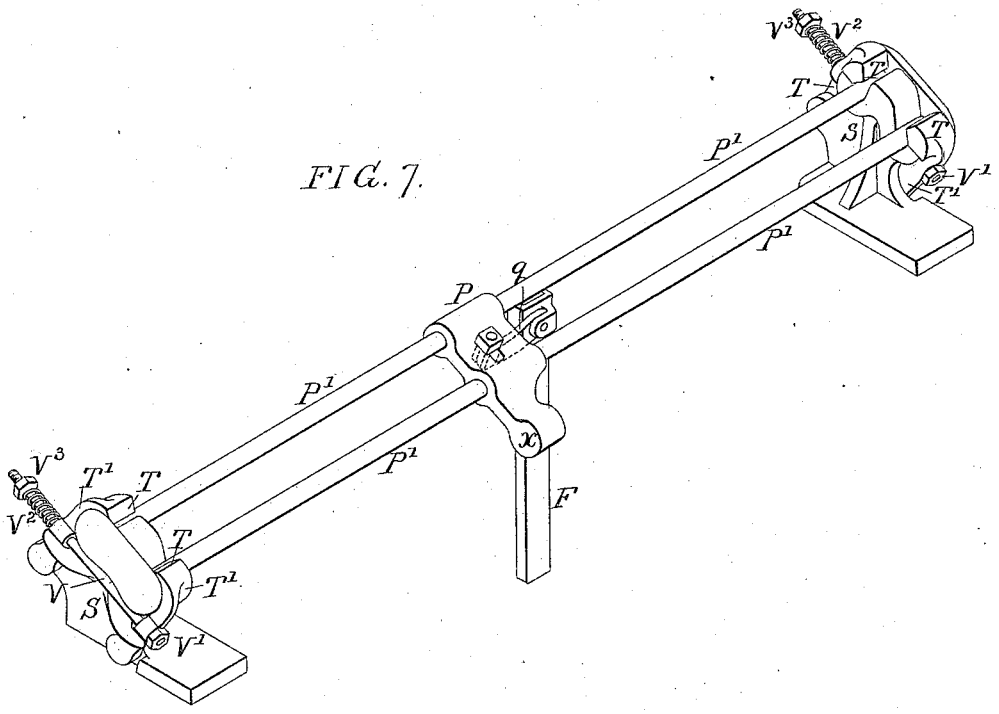
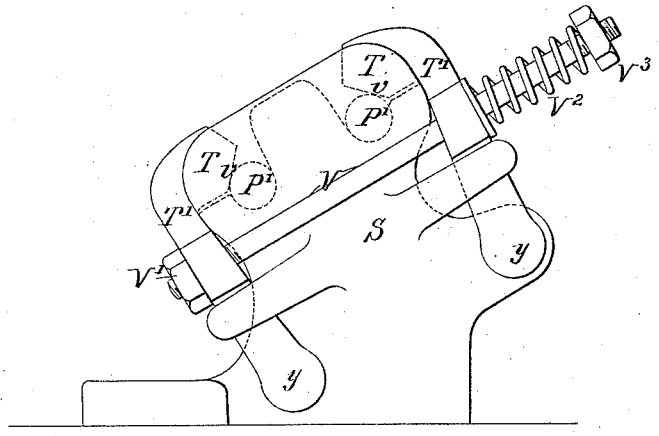


FIG. 8.



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UNITED STATES PATENT OFFICE.

CHARLES H. KNOWLTON AND BENJAMIN F. MEYER, OF CAMDEN, NEW JERSEY, ASSIGNORS TO MERRILL A. FURBUSH AND CHARLES A. FURBUSH, BOTH OF PHILADELPHIA, PENNSYLVANIA.

LOOM PICKING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 306,260, dated October 7, 1884.

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

To all whom it may concern:

Be it known that we, CHARLES H. KNOWLTON and BENJAMIN F. MEYER, citizens of the United States, and residents of Camden, New Jersey, have invented certain Improvements in Loom Picking Mechanism, of which the following is a specification.

Our invention relates to looms of that class of which the patent of W. and J. W. Murkland, No. 97,106, November 23, 1869, is an example; and the main object of our invention is to permit the production of more elaborate patterns than usual, by providing for greater variety in the order or succession in which the picking-sticks are operated, a further object being to prevent injury to the picker, picker-rods, or shuttle-boxes when said boxes are raised before the picker has left the box.

In the accompanying drawings, Figure 1, Sheet 1, is a vertical longitudinal section of sufficient of a loom to illustrate our invention; Fig. 2, Sheet 2, a view of part of the same, looking in the direction of the arrow 1, Fig. 1; Fig. 3, a view on a larger scale of part of the mechanism; Fig. 4, a transverse section on the line 1 2, Fig. 1, also enlarged; Fig. 5, Sheet 1, a transverse section on the line 3 4, Fig. 3; Fig. 6, a section on the line 5 6, Fig. 5; Fig. 7, Sheet 3, a perspective view of the picker, the picker-guides, and the supports therefor; and Fig. 8, a rear view on a larger scale of one of said supports.

A is one of the side frames of the loom, and B the crank-shaft adapted to suitable bearings on the loom-frame, and geared by spur-wheel a and pinion a' to the shaft D, the latter driving, through bevel-gears a^2 and a^3, a vertical shaft, D′, which is connected by bevel-gears a^4 and a^5 to the shaft D^2, carrying the cams D^3, which operate the Jacquard mechanism. The lathe E of the loom is pivoted at the bottom, as usual, and carries at each end the ordinary guided shuttle-boxes E′ and picker-stick F, the latter being hung to a bearing, c, at the base of the lathe, so that its transverse vibration is not interfered with by the vibration of the said lathe. The vibration of the picker-stick F is effected by means of a lever, G, hung to the frame A of the loom, the long arm of this lever being connected to the picker-stick by means of a strap, b, passing round a pulley, b', on the frame A, as shown by dotted lines in Fig. 1. The short arm of the lever G is acted upon by a cam, H, on the crank-shaft B whenever the vibration of the picker-stick is necessary, and said cam is free to move longitudinally on the shaft B, so as to be thrown into and out of action, the longitudinal movement being effected by means of a lever, I, the long arm of which embraces a flange, d, on the cam, the short arm of the lever embracing a waved cam, J, which is free to turn on a stud, e, secured to the frame A. (See Fig. 4.) Only one side of the loom-frame and one end of the lathe are shown in the drawings; but it should be understood that the lathe has at the opposite end a picker-stick, F, and that the opposite side of the loom has a lever, G, connected to the picker-stick, and a cam, H, for actuating said lever, the opposite cams H being connected by a rod, f, so that both cams can be operated in unison by means of one cam, J, and lever I, it being understood that when one cam is moved into action the other will be moved out of action. These parts are all common to looms as at present constructed; but it is usual to drive the cam J by means of spur-gearing from the shaft D and to govern the order in which the picker-sticks are operated by the character of the cam J; but as the size of the latter is necessarily limited, but a few picks from each side are possible before the succession must be repeated; hence the range of patterns which can be produced upon the loom is correspondingly limited. In order to permit greater freedom in this respect, we use a simple uniformly-waved cam, J, in place of the usual patterned cam, and control the operation of said cam J by means of pattern mechanism such as a roller or card-chain, and as the latter can be indefinitely extended the operation of the picker-sticks can be effected in any order which is required by the exigencies of the pattern to be produced, however elaborate said pattern may be.

The pattern mechanism shown in Figs. 1 to

6 of the drawings comprises a roller-chain, K, which is carried by a drum, *g*, having a hand-wheel, *g'*, secured thereto, and free to turn on a fixed spindle, *h*, which is bolted to a plate, L, on the frame A of the loom.

To a bearing in the plate L is adapted a short shaft, *i*, which is driven from the vertical shaft D' by means of bevel-wheels *i'* and *i²*, and carries at the inner end a crank, *j*. This crank is connected by a rod, *k*, to a lever, M, hung to a sleeve, *g²*, projecting from the drum *g*, the short arm of this lever carrying a pawl, *m*, which is adapted to the teeth of a ratchet-wheel, *m'*, secured to the said sleeve. The long arm of the lever M is connected by a rod, *n*, to an arm, N, which is hung to the stud *e*, and carries a pawl, *p*, adapted to the teeth of a ratchet-wheel, *p'*, forming part of the cam J. As the shaft *i* is rotated an intermittent movement is imparted to the pattern-chain and a vibrating movement to the arm N. Hence, if the pawl *p* were allowed to remain in gear with the ratchet-wheel *p'*, there would be a uniform operation of the cam J, a like shifting of the cams H, and a regular alternation in the action of the picking-sticks, the pick being first from one side and then from the opposite side of the lathe. The pawl *p* is, however, connected by a rod, *s*, to an arm, *s'*, hung to the plate L, and acted upon by the rollers or enlargements of the pattern-chain, so that by holding the pawl *p* out of gear with the ratchet-wheel *p'* the movement of the cam J will be arrested, and any desired number of picks can be made from either end of the lathe before shifting the cams H.

It frequently becomes necessary in the operation of the loom to run the same backward for a portion of a turn—as, for instance, in throwing the lathe back to remove a defective filling-thread—and we therefore prefer to allow a certain amount of back movement of the shaft D' without affecting the shaft *i*, so that the pattern mechanism will not be deranged by the slight backward movement of the loom above referred to. This is effected by means of a clutch, one part, *w*, of which is loose on the shaft D', and carries the bevel-wheel *i²*, the other part, *w'*, of the clutch being secured to the shaft, and the projections and recesses of the two parts of the clutch being such that the desired lost motion will be permitted. (See Fig. 2.) The especial form of pattern mechanism shown in the drawings, however, is not essential to our invention. For instance, the pawl *p* may be permitted to remain in engagement with the ratchet-wheel *p'*, and the arm N may be vibrated at irregular intervals, or at such times only as it is necessary to shift the cams H, the rod *n* being extended, as shown by dotted lines in Fig. 1, so that it can be connected to one of the needles of the jacquard, the cards being punched with reference to the proper operation of this needle. The upper end of the picker-stick F is connected by a link, *q*, Fig. 7, to the picker P, which is guided upon rods P', the opposite ends of which are carried by brackets S, secured to projections S' on the lathe, as shown in Fig. 1.

It sometimes happens that the boxes E' are moved before the projecting portion *x* of the picker has left a box; consequently there is a strain upon the picker and its rods, which, when the said rods are rigidly secured at the ends, results in injury to some of the parts. We overcome this objection by adapting the ends of the rods P' to recesses in the brackets S, and retaining them in said recesses by means of jaws T, which are at liberty to yield when undue upward strain is exerted upon the rods P'. In the present instance each jaw T forms part of an arm, T', pivoted to the bracket at *y*. A bolt, V, passes through an opening in each arm, a nut, V', at one end of the bolt bearing on one arm, and a spring, V², being interposed between the other arm and the nut V³ at the other end of the bolt. (See Fig. 8.) Each of the jaws T has an inclined face, *v*, bearing upon the rod P', so that any tendency of the latter to rise will impart an outward thrust to each jaw T and arm T', this thrust being resisted by the spring V².

We claim as our invention—

1. The combination of the shaft B, having cam H, means for rotating the shaft, the lever I, the shifting-cam J, having a ratchet-wheel, *p'*, the arm N, having a pawl, *p*, adapted to the ratchet-wheel *p'*, the pattern-chain, its drum *g*, having ratchet-wheel *m'*, the lever M, having a pawl, *m*, the shaft *i*, having a crank, *j*, connected to the lever, means for rotating said shaft, and devices whereby the pattern-chain is caused to control the pawl *p*, and the lever M is connected to the arm N, as set forth.

2. The combination of the pattern-chain, the shaft *i*, means whereby said shaft is caused to actuate the pattern-chain, the driving-shaft D', gearing connecting the two shafts, and a clutch forming part of said gearing and constructed to have lost motion, as set forth.

3. The combination of the brackets S, rods P', and pivoted arms T', formed with jaws T, with the rods V, springs V², and nuts V' V³, or equivalent stops, as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHARLES H. KNOWLTON.
BENJAMIN F. MEYER.

Witnesses:
JOHN E. PARKER,
HARRY SMITH.