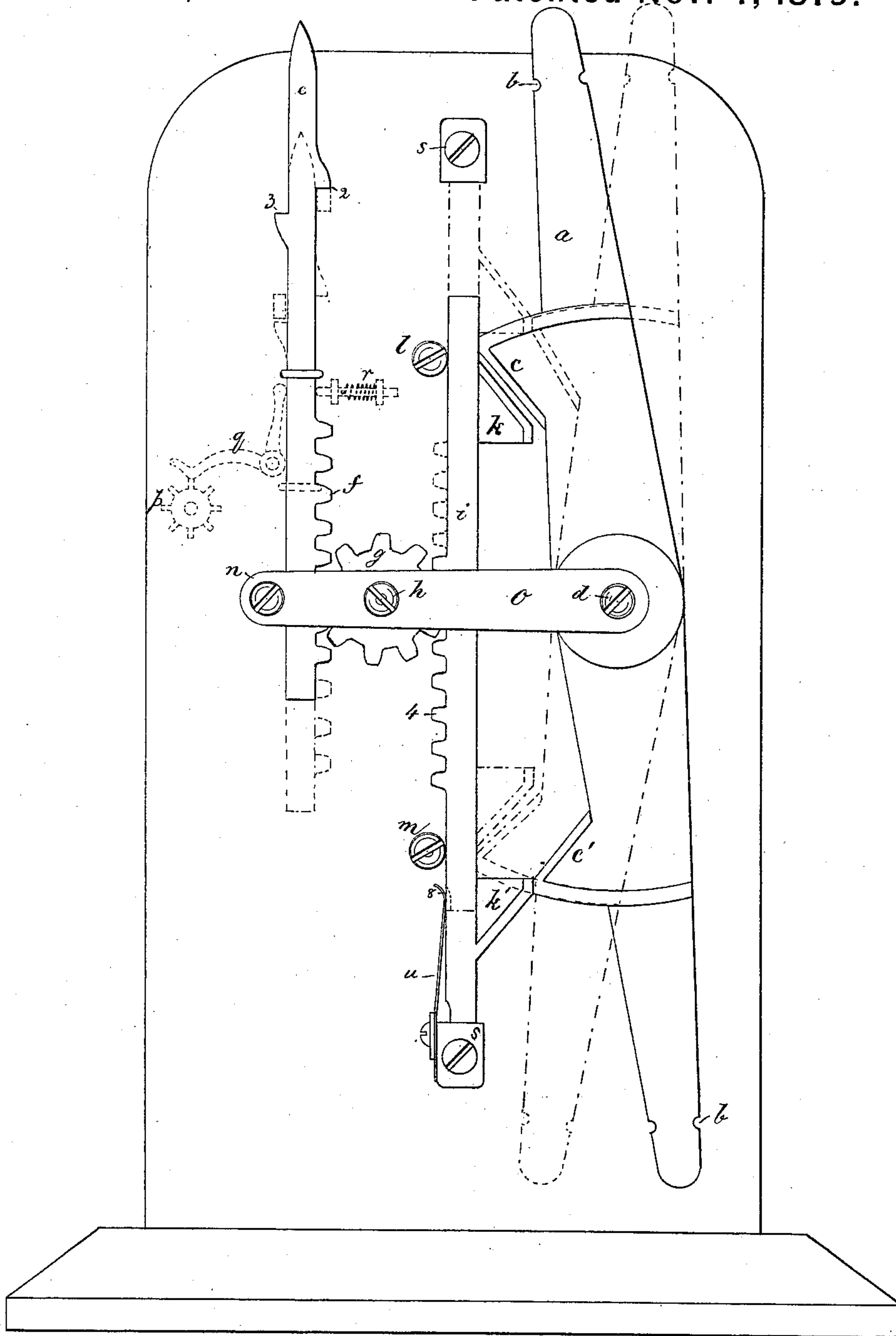


O. W. KENISON.  
Harness-Motion for Looms.

No. 221,321.

Fig. 1. Patented Nov. 4, 1879.



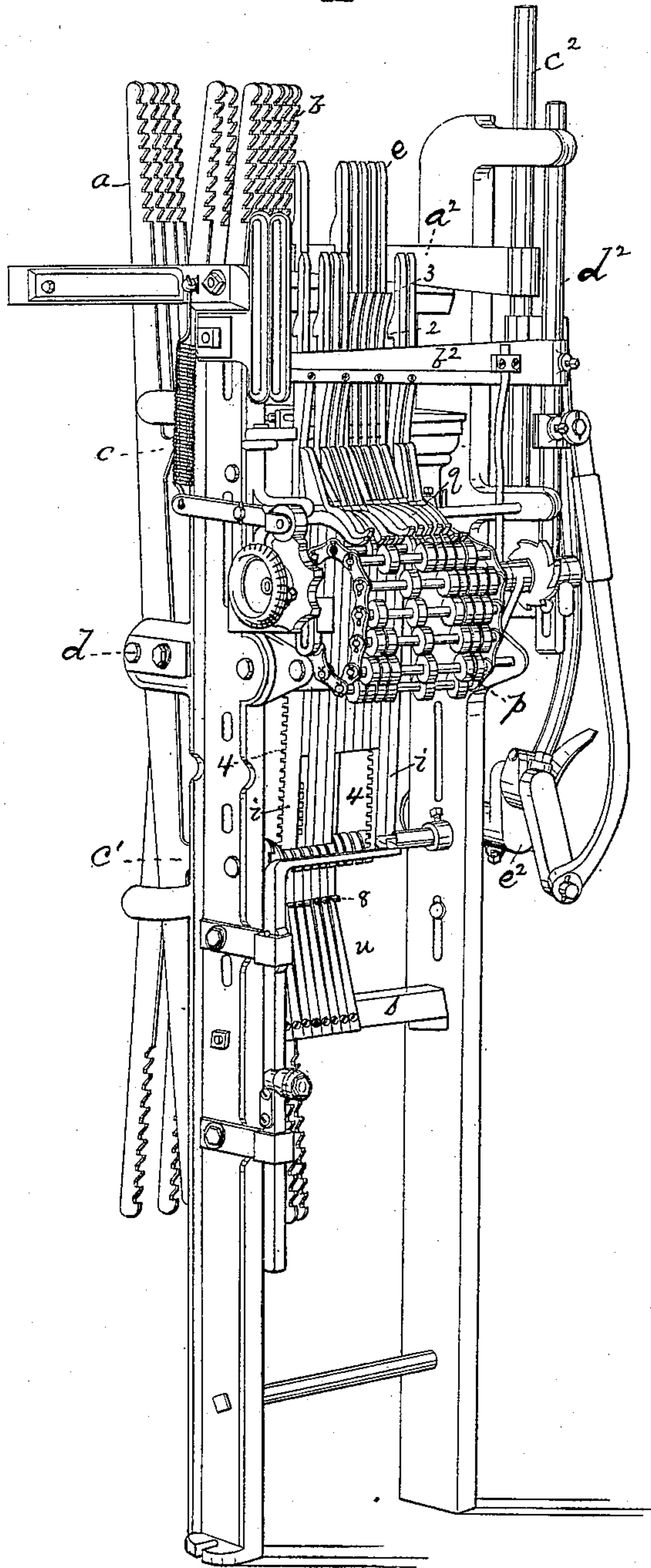
Witnesses.  
J. E. Whitney  
J. P. Cronin.

Inventor.  
Orrin W. Kenison,  
by Crosby & Gregory, Attys.

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Fig. 2.



Witnesses.

Laurence F. Connor.  
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# UNITED STATES PATENT OFFICE

ORRIN W. KENISON, OF LAWRENCE, MASSACHUSETTS.

## IMPROVEMENT IN HARNESS-MOTIONS FOR LOOMS.

Specification forming part of Letters Patent No. **221,321**, dated November 4, 1879; application filed July 21, 1879.

*To all whom it may concern:*

Be it known that I, ORRIN W. KENISON, of Lawrence, county of Essex, State of Massachusetts, have invented an Improvement in Harness-Motions for Looms, of which the following description, in connection with the accompanying drawings, is a specification.

This invention relates to improvements in harness-motions for looms; and it consists, essentially, in an upright lever provided with inclines combined with and operated by means of wedge-bars actuated by pinions engaged at their opposite sides or edges by the rack or gear teeth of the notched jacks under the control of a pattern-surface, whereby the said upright levers and the harness-frames to be attached thereto by cording running, preferably, over sheaves, as usual, are operated positively by a small expenditure of power.

Figure 1 represents, in side elevation, sufficient portion of my improved harness-motion to enable others skilled in weaving to understand my invention. Fig. 2 is a perspective view of a series of upright levers, notched jacks, and wedge-bars as they will appear when embodied in a working loom, the said figures showing means for operating the notched jacks.

The lever *a* is supposed to represent an upright lever about four feet long, it being provided at bottom and top with one or more sets of notches, *b*, for the proper connection therewith of the usual cording, which is to attach the levers to the usual harness-frames at bottom and top. Each upright lever has attached to or made part of it, at one edge, two inclines, *c c'*, the said inclines pointing in opposite directions, and being located thereon, preferably, at about eight inches from the fulcrum *d* of the lever; but it is evident the said inclines may be more or less distant from the said fulcrum.

The notched jacks *e*, having shoulders 2 3, to be engaged by the usual lifter and depressor, and provided with rack-teeth *f*, are all as in my United States Patent No. 162,238, April 20, 1875, to which reference may be had, and in this present case the notched jacks may be operated at the proper time by devices such as shown in the said patent, it representing an

elevator and depressor and pattern-cylinder, and fingers interposed between the said notched jacks and the pattern-surface, the said notched jacks being, however, in this present invention, when in use, pressed toward and in contact with the fingers by spiral or other springs, such as shown in my United States patent, No. 213,208, March 11, 1879, to which reference may be had.

The rack-teeth of each jack-bar *e* engages a pinion or toothed wheel, *g*, having its pivot at *h*, the said pinion, at its opposite side, engaging the rack-teeth 4 of a slide-bar, *i*, provided with oppositely-inclined wedges *k k'*, one of which wedges, as the slide-bar is reciprocated, acts against one of the inclines *c* or *c'* of the upright lever and turns it on its fulcrum.

When one wedge operates upon one incline to turn the lever *a*, the heel of the other wedge moves toward the center of the lever *a* and along its opposite incline without exerting any force upon the said incline.

By placing one jack-bar and one slide-bar at each side of the pinion I am enabled to utilize the pinion, not only as a source of motion for the slide-bar, but as a connecting device between the said bars to enable one to counter-balance the weight of the other, so as to require the least possible expenditure of power on the part of the elevator and depressor to operate the said notched jacks and the levers and harness-frames.

At the rear edge of each slide-bar are guides *l m* to prevent the said slide-bars from moving away from the levers *a* when the wedges and inclines are in operative contact. These guides will, in practice, be made as rollers, to obviate friction. At the rear of the jack-bar, as at *n*, is a roller to act upon and keep the teeth in engagement with the teeth of the pinion.

In the drawings, Fig. 1, I have shown but one lever (the outside lever) and one slide-bar pinion and jack-bar; but in practice, it will be remembered that a number of levers and pinions will be placed side by side on common fulera or centers, and that a series of jack-bars and a series of slide-bars will extend back of those shown. The fulera for the levers and pinion, and the center for the roller *n* are carried by an arm, *o*, which will form part of or pro-

ject from the loom-frame, there being two such arms on each side the series of devices for actuating the harness-operating mechanism.

In the drawings, Fig. 1, I have shown in dotted lines a pattern-cylinder,  $p$ , a finger,  $q$ , a spring-pressed rod,  $r$ , and an elevator and depressor, and it will be understood that these devices will be operated in any usual manner.

In Fig. 2, under a slightly-modified form, I have shown a series of upright levers,  $a$ , with inclines, as described, and the notched jacks and wedge-bars; and have also shown the notched jacks in operative connection with a lifter,  $a^2$ , and depressor  $b^2$ , connected with slide-rods  $c^2 d^2$ , reciprocated at the proper time by cranks, as at  $e^2$ , which, being old and of usual construction, need not be herein described. The fingers  $g$  are in this figure shown as acted upon by rolls of an ordinary pattern-chain.

The slide-bars, at the ends of their upward and downward strokes, meet stops  $s$ , which prevent them going too far. The lower end of each slide-bar is provided with a notch to be

entered by the end  $S$  of a spring,  $u$ , which acts to retain each slide-bar in its most elevated position and obviate accidental falling or depression thereof. The lever and jacks and slide-bars are shown in dotted lines in their opposite positions.

I claim—

The upright lever provided with the reverse-ly-placed inclines, and the slide-bar having wedges to act upon the said inclines, combined with the pinion and notched jacks and mechanism to move the slide-bars, the slide-bar and notched jack being placed at opposite edges of the said pinion to thereby counter-balance each other, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ORRIN W. KENISON.

Witnesses:

G. W. GREGORY,  
N. E. WHITNEY.