

(No Model.)

3 Sheets—Sheet 1.

J. MACFARLANE.  
VERTICAL LOOM.

No. 278,715.

Patented June 5, 1883.

Fig. 1.

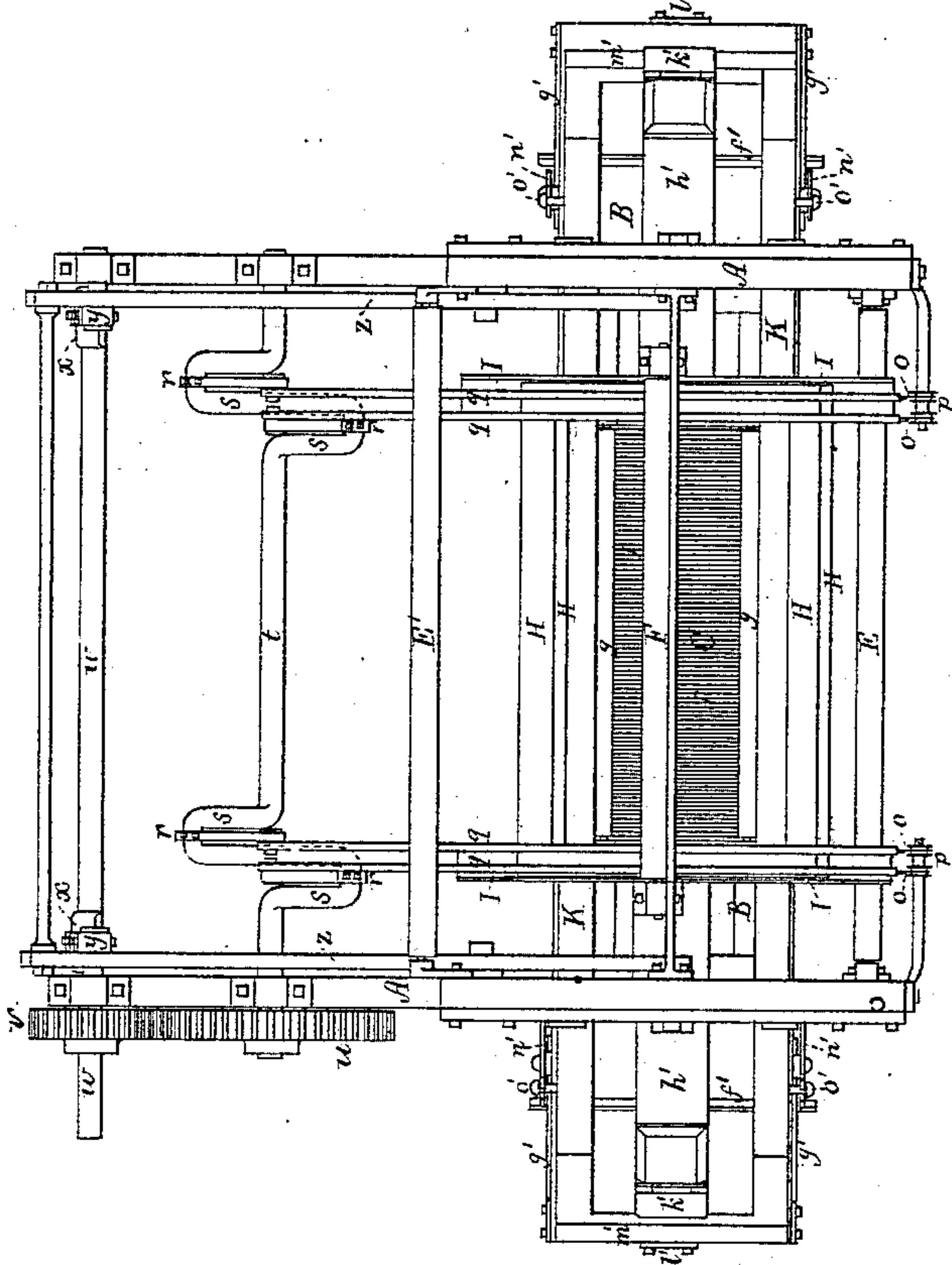


Fig. 6.

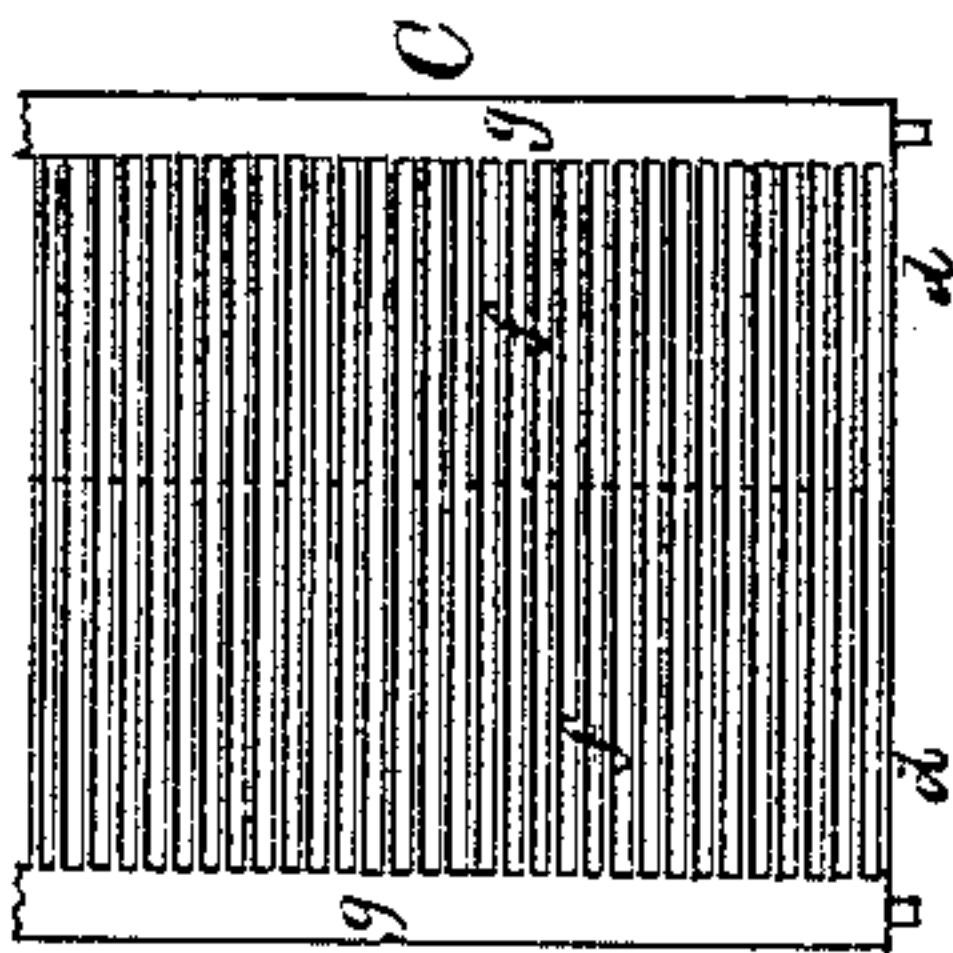


Fig. 7.

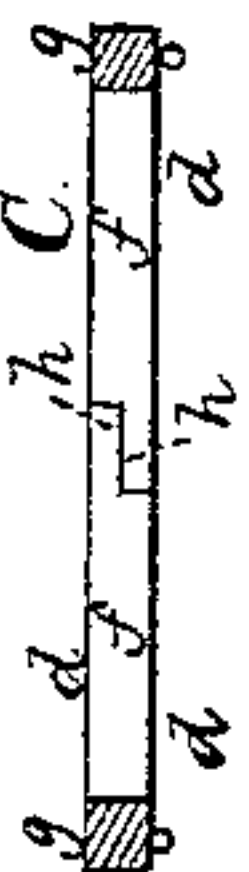


Fig. 9.

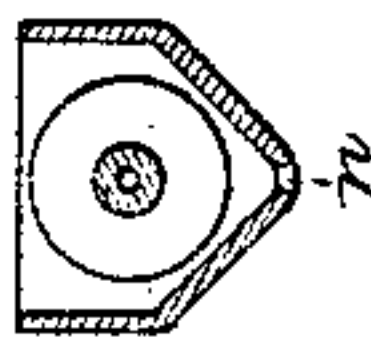
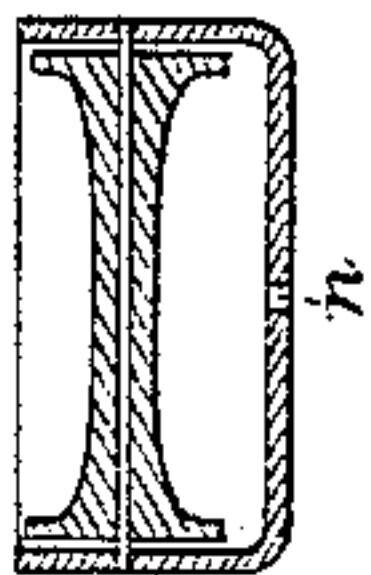


Fig. 8.



Witnesses.

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Fig. 3.

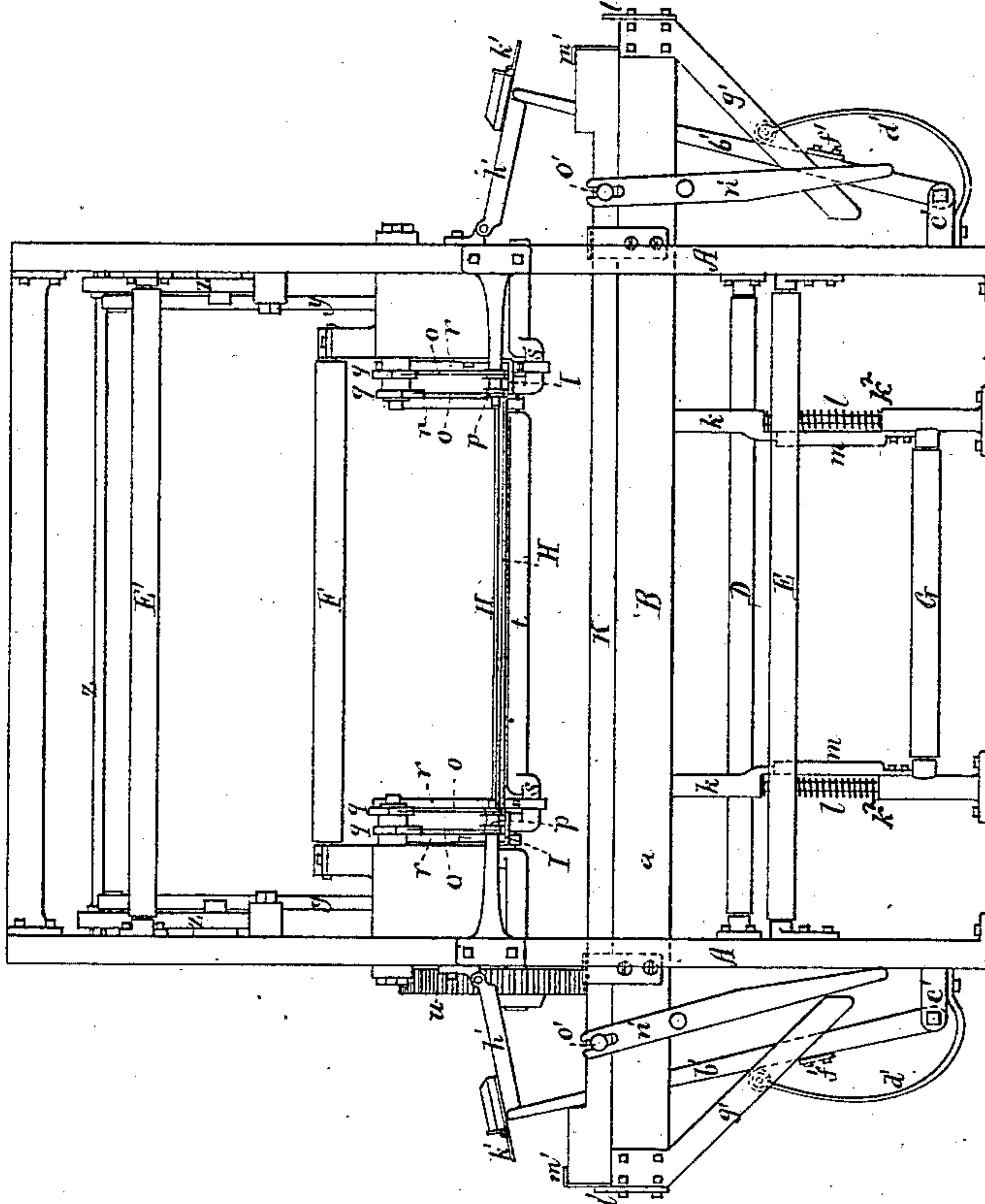
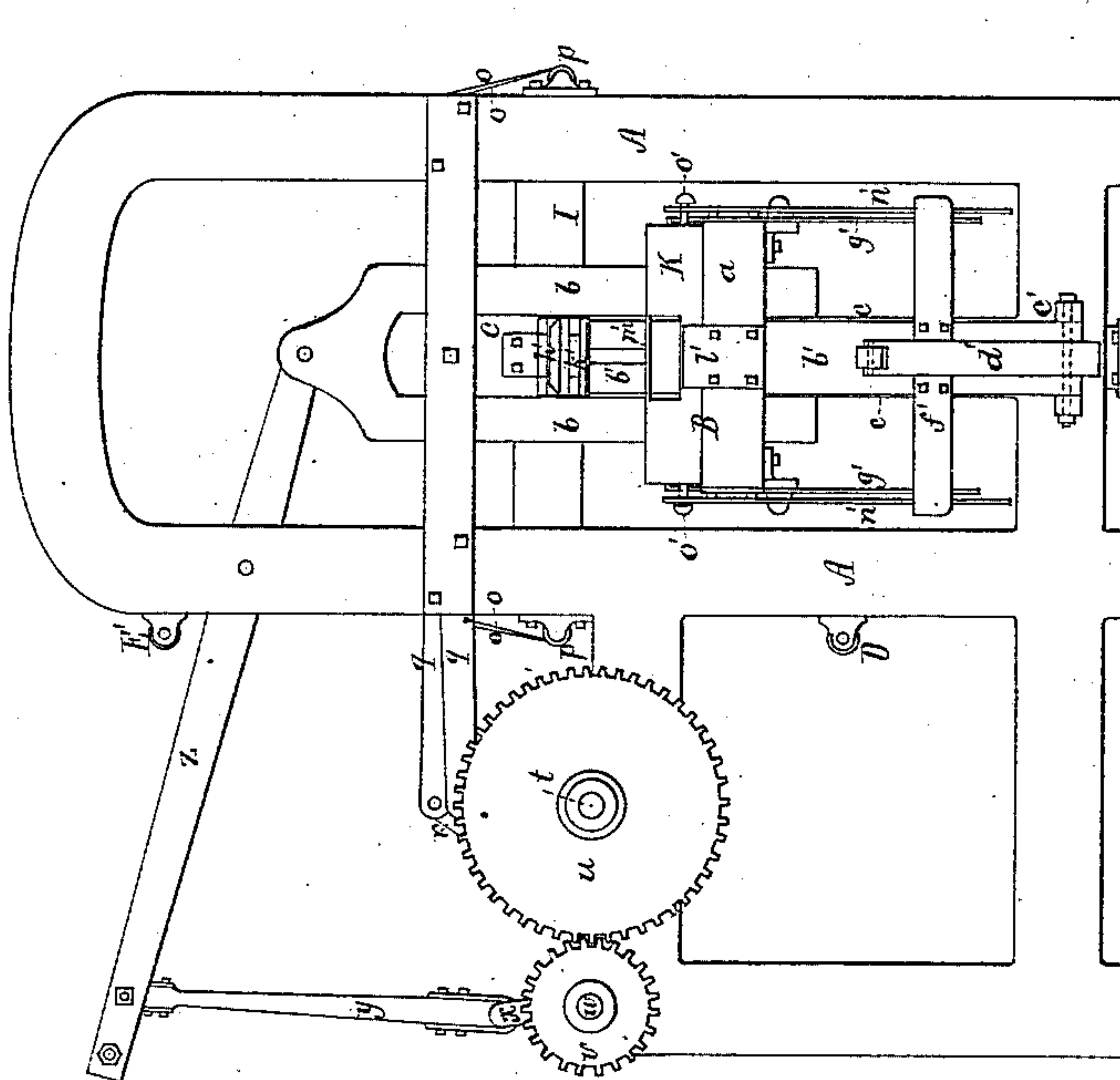


Fig. 2.



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Fig. 5.

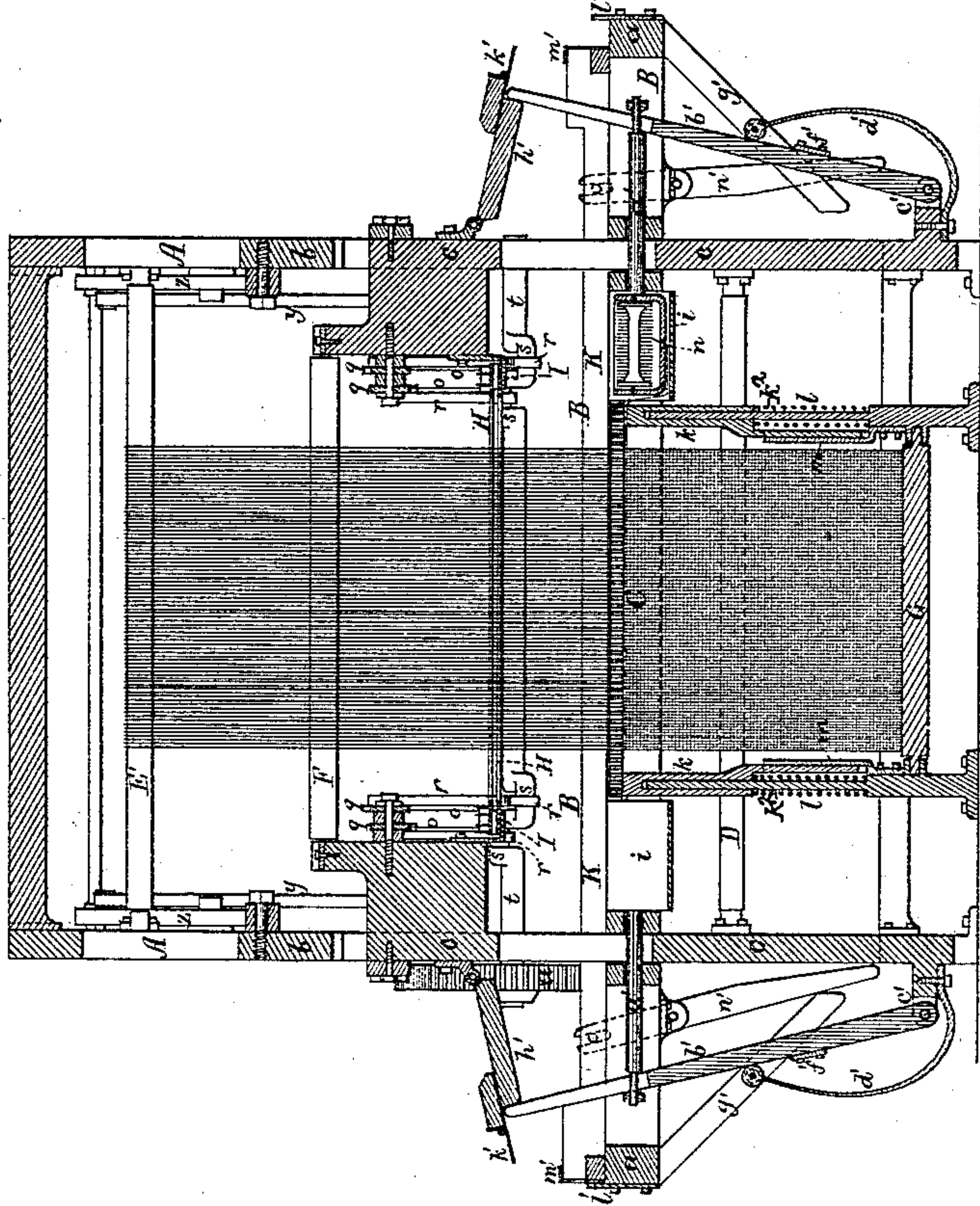
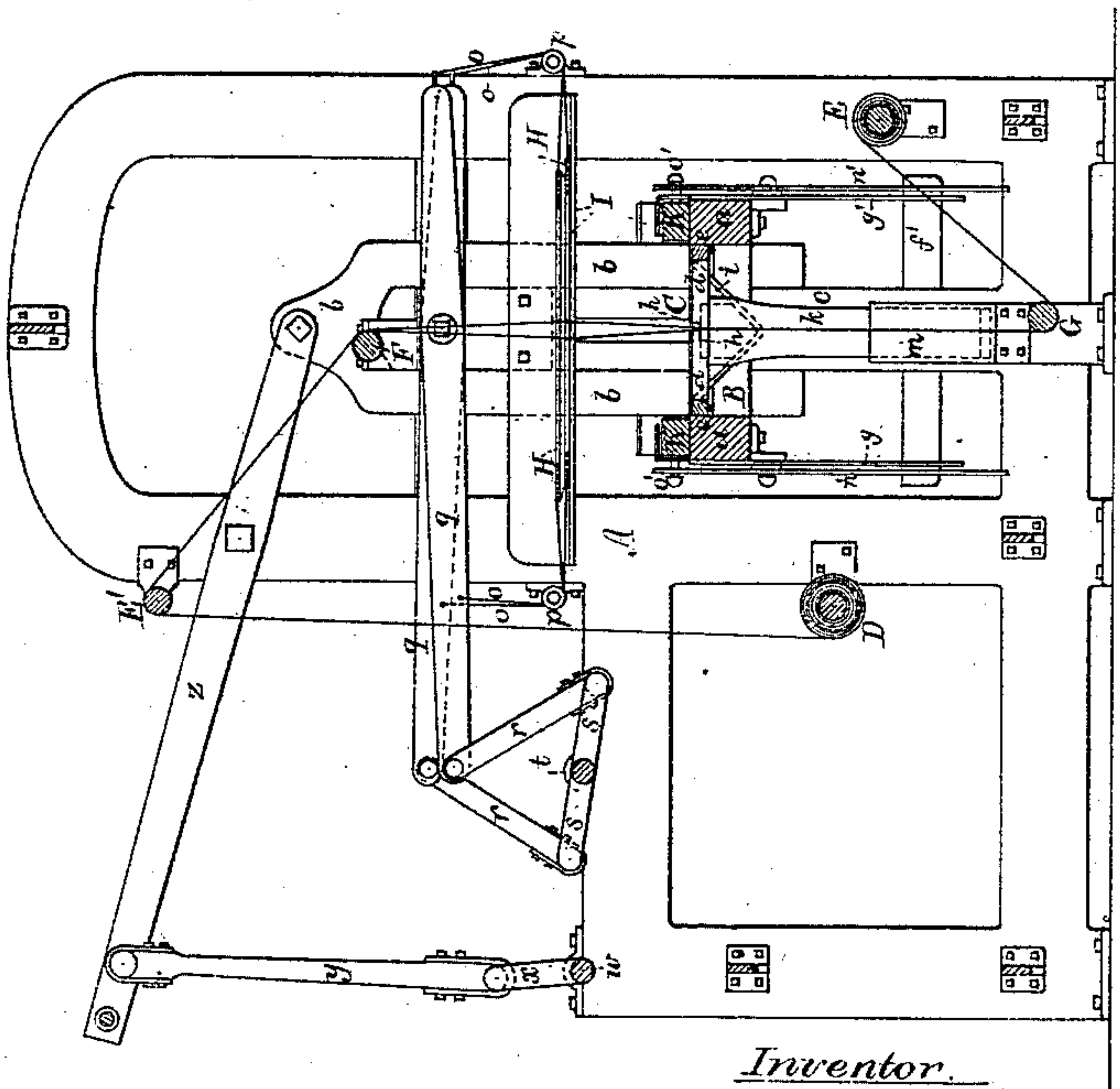


Fig. 4.



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# UNITED STATES PATENT OFFICE.

JAMES MACFARLANE, OF CLAREMONT, NEW HAMPSHIRE.

## VERTICAL LOOM.

SPECIFICATION forming part of Letters Patent No. 278,715, dated June 5, 1883.

Application filed September 19, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES MACFARLANE, of Claremont, in the county of Sullivan, of the State of New Hampshire, have invented a new and useful Improvement in Vertical Looms; and I do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—

10 Figure 1 is a top view, Fig. 2 a side elevation, Fig. 3 a front view, Fig. 4 a longitudinal section, and Fig. 5 a transverse section, of a loom embodying my invention, the nature of which is defined in the claims hereinafter presented. The section last named is taken through the lay. Fig. 6 is a top view, and 15 Fig. 7 a transverse section, of the sectional reed, to be described. Fig. 8 is a longitudinal section, and Fig. 9 a transverse section, of the shuttle and its bobbin.

This loom differs in the following particulars from most if not all others in general use: First, the lay, which is horizontal and is movable vertically, as is common, is provided with 25 a reed constructed in two separate sections, each of which is hinged at or near its outer edge to the lay, the dents of each section being constructed to lap on those of the other when the two sections are in one plane with each other; second, the mechanism for automatically operating the shuttle is different from all 30 others, and operates differently.

In the drawings, A denotes the loom-frame, and B the lay. The said lay is composed, 35 mainly, of a rectangular frame, *a*, and two standards, *b b*, such standards being extended upward from the frame *a*, and adapted to straddle the stationary posts *c c*, all being as shown. Within the lay is the reed C, composed of two separate sections, *d d*, which at 40 their outer edges are hinged to the opposite parts *e e* of the lay. Each of such sections consists of a series of dents, *f*, and their sustaining-bar *g*. Each dent at and near its inner end is notched, as shown at *h*, to receive and 45 lap on the opposite or fellow dent when the two sections are closed together in one plane with each other, such being to enable the dents, when closed and descending, to crowd the fill-

ing down closely into the warp. The sectional 50 reed is between two shuttle-boxes, *i i*, arranged in the lay. Underneath the reed is the mechanism for closing the reed-sections, or causing them to move into one horizontal plane with each other, when the lay is descending, 55 such mechanism consisting of two posts, *k k*, supported on springs *l l*, said posts being movable in vertical guides *m m*, and guided by rods *k<sup>2</sup> k<sup>2</sup>*, which support the springs *l l*. In moving downward the lay carries the reed- 60 sections, near their opposite ends, down upon the two posts, whereby the sections close together, or move upward into one plane with each other, they, while the lay is descending to beat up the filling, being maintained in their 65 horizontal positions by suitable stops or by the outer flattened sides of the bars *g* bringing up against the opposite parts *e e* of the lay.

In Figs. 8 and 9 is shown a form of shuttle which I propose to use with this loom. This 70 shuttle has an angular bottom, in the angle of which is the hole *n*, for the exit of the filling-thread. It will be seen that the shape given the bottom adapts the shuttle for use with the peculiar reed herein described. The sections 75 of the reed, being down as the shuttle flies, form a trough to which the bottom of the shuttle is adapted.

The yarn-beam is shown at D, and the cloth-beam at E. The warps pass from the yarn-beam 80 D upward to and over a guide-roller, E', thence to another guide-roller, F, thence downward through the reed to and under a guide-roller, G, such guide-rollers being arranged as shown. From the roller G the woven cloth passes to 85 the cloth-beam E, which, like those of other looms, is to be provided with means of revolving it to take up or wind upon it the cloth as fast as it may be woven, the construction and operation of these parts being such as is com- 90 mon in this class of looms.

The harnesses shown at H H are arranged horizontally on stationary shelves or guides I I. Each harness, by means of four lines, *o*, extending from it in opposite directions partly 95 around loose pulleys *p*, is connected with two of a set of four levers, *q*, arranged in the loom-frame in manner as represented and fulcrumed



thereto. By means of connecting rods or links *r*, these levers at their rear ends are coupled to cranks *s* of a shaft *t*, arranged as shown, and provided with a spur-gear, *u*, that engages with a pinion, *v*, fixed on the driving-shaft *w* of the loom. This latter shaft has cranks *x*, by which and connecting-rods *y* it is connected with a frame, *z*, arranged in the loom-frame and fulcrumed thereto, and jointed to the standards *bb* of the lay. On revolving the driving-shaft *w*, not only will reciprocating vertical movements be imparted to the lay, but the harnesses will be moved in their proper order. While the lay may be rising the reed-sections will drop into inclined positions, in order for the shuttle to be driven across the lay and through the decussation of the warps. The filling from the shuttle during each flight of it will be laid between and below the two reed-sections, in order that during the succeeding descent of the lay and after the closing of the reed such filling may be beaten home into the warp by the reed.

The next part of the loom to be described is the mechanism for operating the shuttle, or driving it alternately through the warps, or from one shuttle-box to the other and back again.

Within the lay, and arranged to slide endwise in the shuttle-boxes, are two pickers, *a' a'*, each of which is connected with one of two movable picker-staffs, *b' b'*, which, arranged as represented, are at their lower ends hinged to the frame, as shown at *c' c'*. As each picker has to move with the lay, such picker is adapted to its staff, so as to slide upward and downward therein, and still be movable endwise of the lay, with and by the staff. In the present instance the upper ends of the staffs are slotted lengthwise, and the reduced ends of the pickers rest loosely in such slots, being held by nuts, so that the pickers can move up and down on the staffs, and yet are moved endwise by the latter. Each staff is provided with an impelling-spring, *d'*, which at its upper end bears against the staff, the lower end being secured to the frame, and is arranged as represented.

Extending across and secured to each picker-staff is a bar, *f'*, over which and projecting downward from the lay are two inclined plates or cams, *g'*. While the lay may be descending, these cams *g'* are borne against the bars *f'*, so as to force the picker-staffs and pickers outward against the action of the actuating-springs *d'*. On the picker-staffs having been so moved outward, they will be caught and held in position by gravitating catch-pawls *h'*, arranged as represented, and hinged to the posts *c*. Each of the catch-pawls, formed as shown, is provided at its outer end with an angle-plate or tripper, *k'*, formed and arranged with it as shown, and hinged to it. Furthermore, there is arranged on the top of the lay, and adapted thereto so as to be capable of

sliding endwise thereon, a rectangular frame, *K*, whose extent of endwise movement is limited by two stops or abutments, *l'*, extending upward from the lay at its ends, in manner as represented. At each end of the frame *K* is a bar or shelf, *m'*, that projects inward from such end. Forked levers *n'*, fulcrumed to the sides of the lay and arranged as shown, receive between their prongs studs *o'*, projecting from the frame *K*. During each rise of the lay one of the two shelves *m'* will be moved upward against one of the trippers *k'*, and will bear it against its catch-pawl *h'* and force the latter upward above its picker-staff, which will be immediately driven forward by its spring *d'*, and thereby cause the shuttle to be put in flight through the warps. While each picker-staff is being driven inward its cross-bar *f'* will be forced against the lower arms of the two adjacent forked levers *n'*, and will move such levers endwise on the lay, so as to cause the frame *K* to be moved from contact with one stop *l'* into contact with the other stop *l'* on the opposite end of the lay, in order for the frame to be properly set for effecting on the next rise of the lay the throwing of the catch-pawl out of engagement with the opposite picker-staff. The trippers *k'* are pivoted upon the catch-pawls *h'*, so that when either tripper is engaged by a shelf, *m'*, in the descent of the lay it will give way and allow the shelf to pass downward by it. By means thus described it will be seen that in each rise of the lay the shuttle will be driven across the reed, which then will be open for the shuttle to pass and for the filling from it to be laid between and below the movable sections of the reed. In the next descent of the lay the reed-sections will be closed and forced downward upon the filling, so as to beat it into place in the warps.

What I claim as my invention is as follows, viz:

1. The combination, with the lay, of the two reed-sections arranged therein and applied thereto, substantially as set forth.
2. The combination of the vertically-movable lay and the two reed-sections, arranged therein and adapted thereto substantially as set forth, with the horizontally-movable harnesses, such lay, reed-sections, and harnesses being provided with mechanism for operating them, essentially as specified.
3. The combination of the vertically-movable lay and the two reed-sections, arranged therein and adapted thereto substantially as set forth, with the horizontally-movable harnesses and the reciprocating shuttle, all being arranged and provided with mechanism for operating them, essentially as explained.
4. The combination, substantially as described, of the pickers *a'*, picker-staffs *b'*, their actuating-springs *d'*, and cross-bars *f'*, with the cams *g'*, catch-pawls *h'*, trippers *k'*, frame *K*, stops *l'*, shelves *m'*, levers *n'*, the lay *B*, and



the stationary posts *c*, essentially as described and represented.

5. The sectional reed having the dents of each of its two sections adapted to lap on those of the other of the said two sections when the sections are closed or in one plane with each other, as set forth, such being in order for the beating of the filling into the

warps to be performed by one of the sections, and its dents to be sustained at the time by those of the fellow section.

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Witnesses:

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