

No. 688,531.

Patented Dec. 10, 1901.

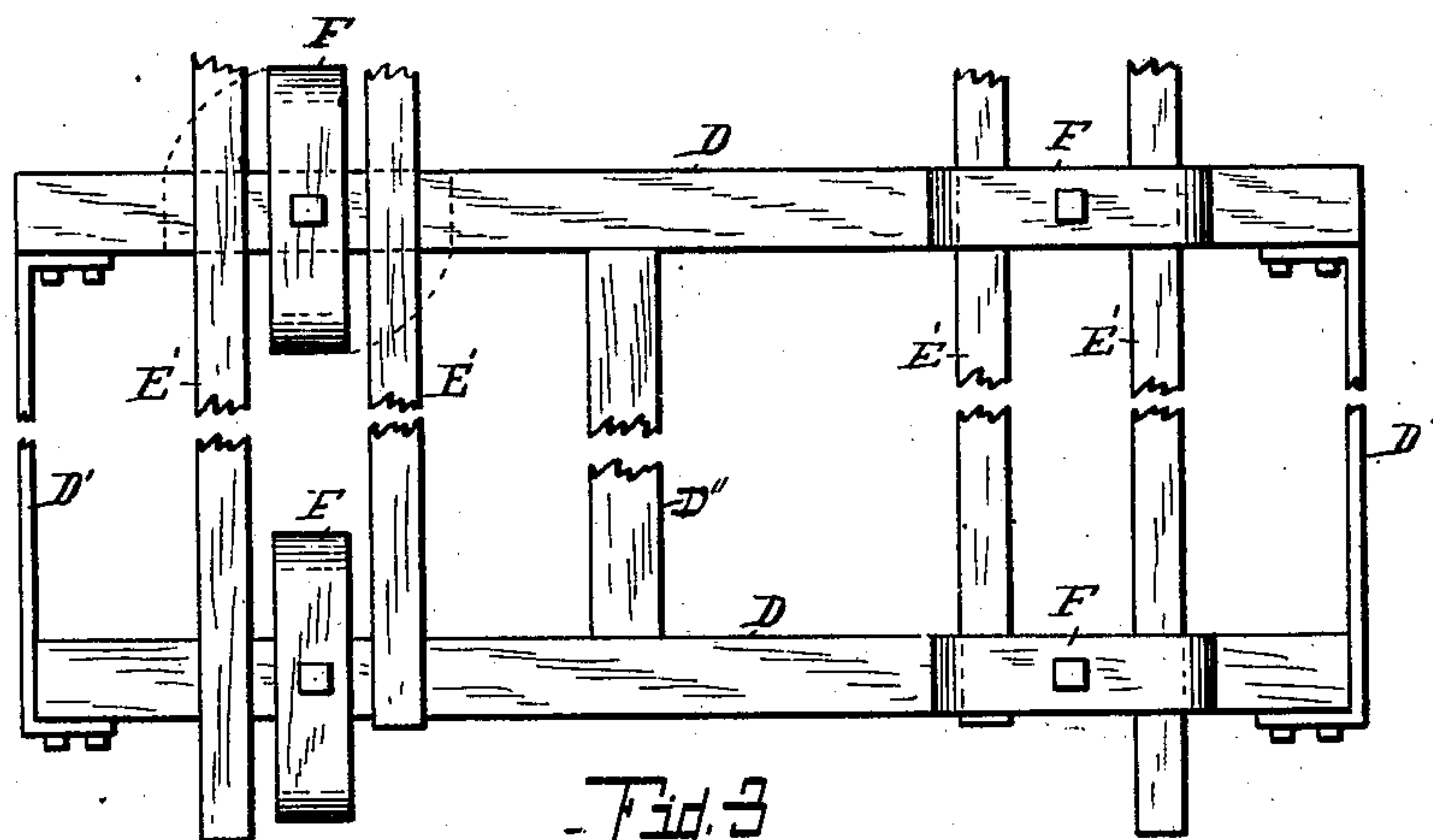
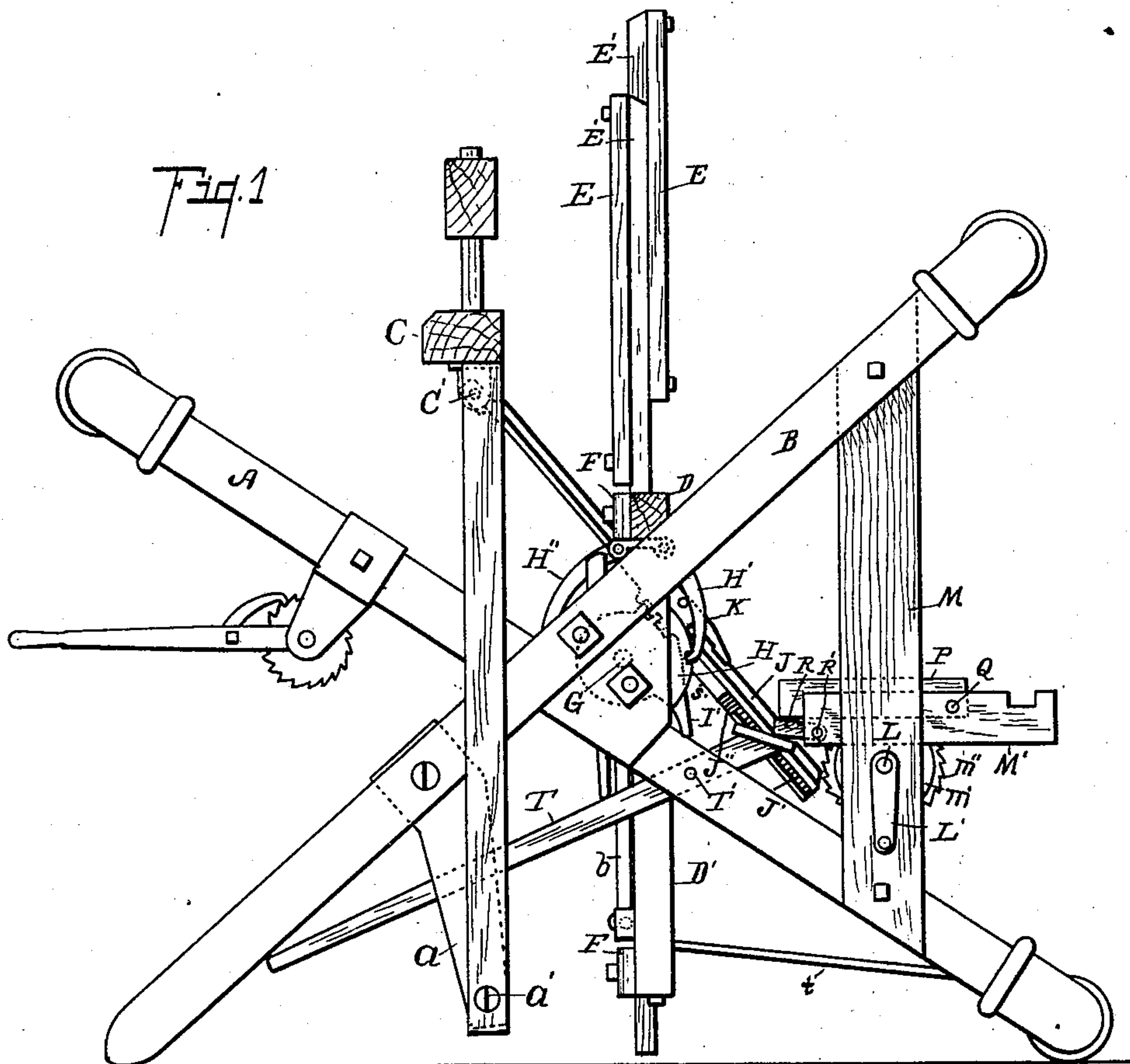
W. H. KYNETT & I. J. TUTTLE.

LÒOM.

(Application filed Dec. 4, 1900.)

(No. Model.)

3 Sheets—Sheet 1.



Witnesses:

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Otis A. Earl

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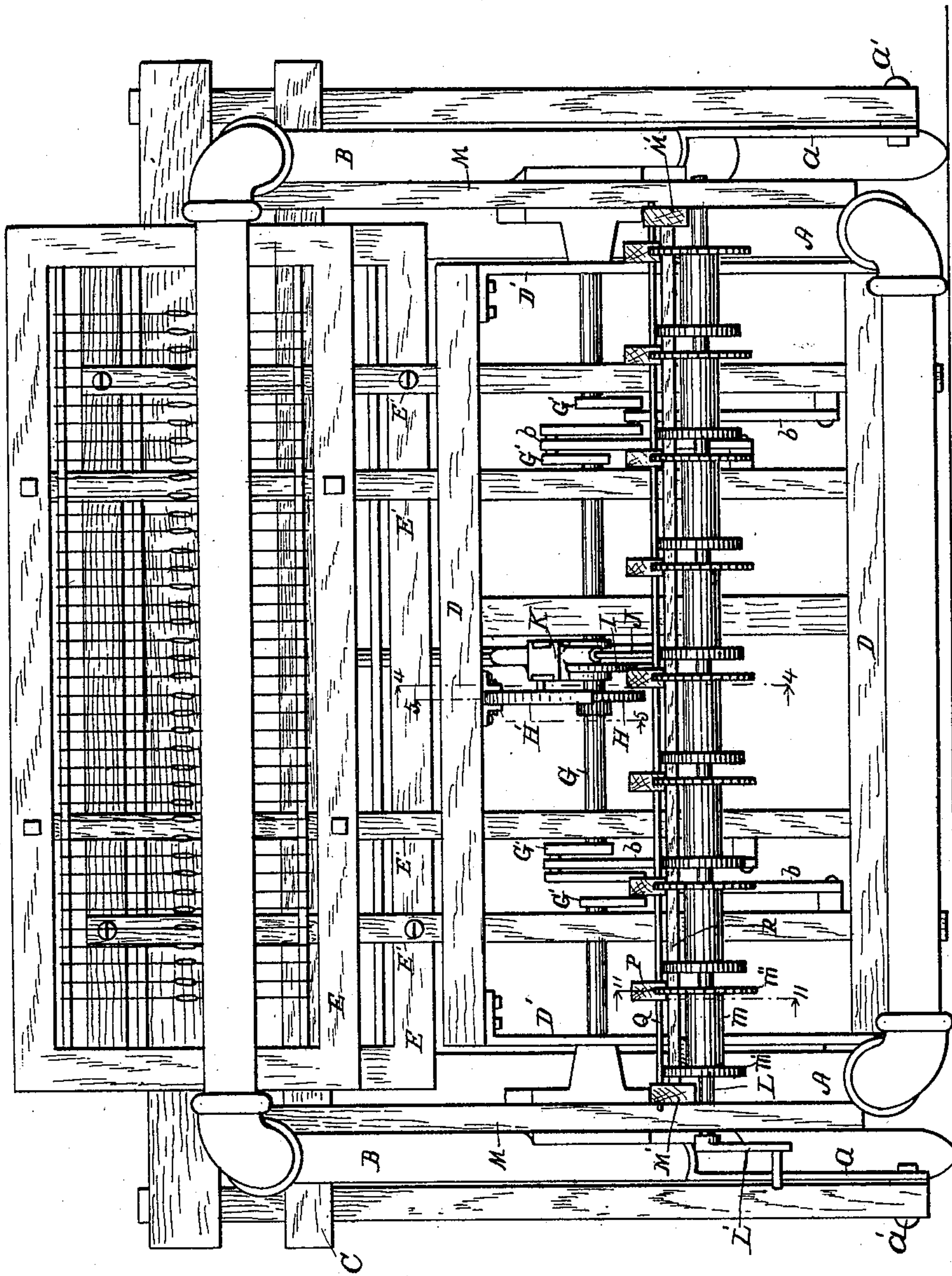


Fig. 2

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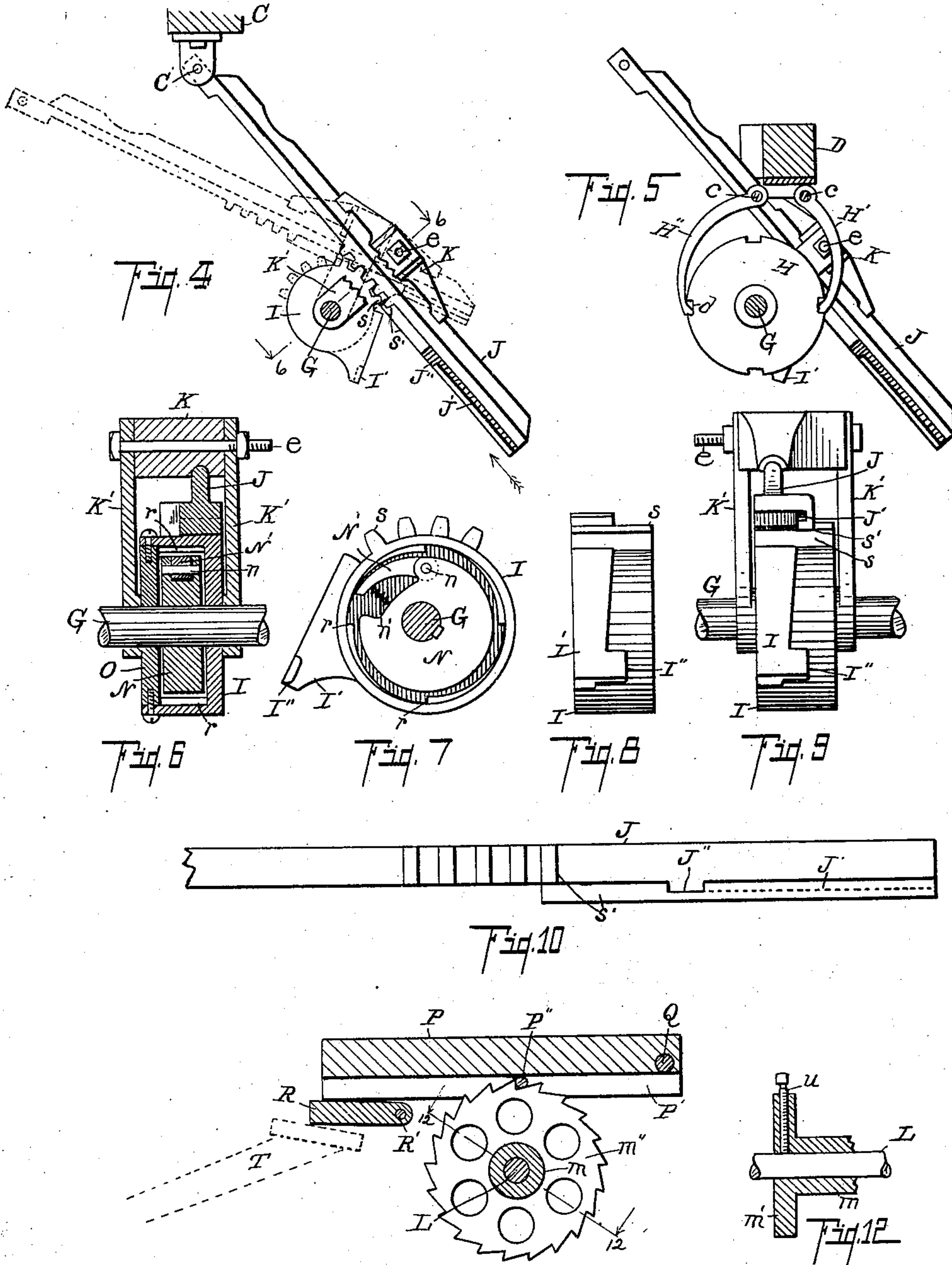
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3 Sheets—Sheet 3.



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Fig. 11

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UNITED STATES PATENT OFFICE.

WILLIAM H. KYNETT AND IRA J. TUTTLE, OF BATTLECREEK, MICHIGAN;
SAID TUTTLE ASSIGNOR TO SAID KYNETT.

LOOM.

SPECIFICATION forming part of Letters Patent No. 688,531, dated December 10, 1901.

Application filed December 4, 1900. Serial No. 38,609. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. KYNETT and IRA J. TUTTLE, citizens of the United States, residing at the city of Battlecreek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Looms, of which the following is a specification.

This invention relates to improvements in looms.

The invention relates to improvements in the warping-beam and to improvements in the harness supporting and shifting devices and to other parts of the loom and an adaptation of the same to the particular design of a loom to which we have referred, as will appear from the description to follow.

The objects of the invention are to provide in this connection a warping-beam designed and constructed to deliver warp from so much of the length of the same as may be desired without interfering with the remainder of the warp thereon; second, to provide improved connections and devices for controlling such beam; third, to provide in connection with the loom an improved harness-support, and, fourth, to provide an improved harness-shifting device automatically operated from the lathe or beater.

Still further objects will appear from the detailed description to follow.

We accomplish the objects of our invention by the devices and means and mechanism described in this specification.

The invention is clearly described, and pointed out in the claims.

A structure fully embodying the features of our invention is fully illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation of the loom embodying the features of our invention. Fig. 2 is a rear elevation of the same. Fig. 3 is a detail elevation view of the supporting-frame for the heddles, showing the manner of securing and supporting them in position. Fig. 4 is an enlarged detail sectional elevation of the harness-shifting device, taken on line 4 4 of Fig. 2. Fig. 5 is a detail sectional view of the harness-shifter, taken on the regular sectional line 5 5 of Fig. 2. Fig. 6 is an enlarged

detail sectional view of the harness-shifter, taken on line 6 6 of Fig. 4. Fig. 7 is an enlarged detail sectional view of the ratchet mechanism of the harness-shifter with the cap O removed from the casing, so that the details may appear. Fig. 8 is a detail elevation view from the left-hand side of the structure appearing in Fig. 7. Fig. 9 is also a similar detail elevation view of the same parts in the same position with the rack-bar and its guide added. Fig. 10 is an enlarged detail plan view of a portion of the underside of the rack-bar J. Fig. 11 is an enlarged detail sectional view through the warp-beam on line 11 11 of Fig. 2, showing the details of construction of the detent and the position of the releasing-block for raising the detent and releasing the sections of the warp-beam. Fig. 12 is a detail longitudinal sectional view of the opposite end of the warp-beam section M, showing the head M', taken on a line corresponding to line 12 12 of Fig. 11 and showing the arrangement of the set-screw for locking the said section to the shaft L.

In the drawings all of the sectional views are taken looking in the direction of the little arrows at the ends of the section-lines, and similar letters of reference refer to similar parts throughout the several views.

Referring to the lettered parts of the drawings, A and B are rectangular frames, the sides of which cross each other somewhat like a letter X and are retained in position by a bracket to which they are adjustably attached, so that the frame can be folded compactly together, this being a feature of one of our former patents. The front bar of the frame A is the breast-beam of the loom, and the cloth-beam is supported in suitable brackets below the same, the parts not being definitely referred to by letter, as our invention does not relate to it specially. Upright bars or posts M M connect the rear portions of the frame A B together, the same being attached thereto by suitable bolts. Extending through these posts M is a shaft L, which is provided with a crank L' or other means of actuating it. On this shaft L is supported the warp-beam, which is here made sectional, each section being shaped like a spool, the shaft L extending axially through

the same. At one end of each spool or section m is a ratchet-wheel m'' . A click or pawl is provided for each ratchet-wheel, the same consisting of a bar P with a groove P' in its under side, which embraces the ratchet-wheel. A transverse pin P'' through the bar engages the teeth of the ratchet-wheel. These pawls are supported in the transverse shaft or rod Q , which is arranged above and to the rear of the shaft L and is supported by cross-pieces M' , which are secured to the posts M . These clicks P are controlled simultaneously by a common bar R , extending underneath the same, which is pivoted to one side of the same at R' to the front of the cross-pieces M' . This controller is actuated by a lever T , which extends downwardly and forwardly therefrom to the front of the loom in convenient reach of the foot of the weaver to be operated when it is desired to feed the warp, the said lever being pivoted at T' on the frame A . Each of the spools or sections of the warp-beam is provided with a set-screw u through the head m' for securely locking them onto the shaft L when desired. The head m' is at the opposite end of the spool from the ratchet-wheel m'' . It will thus be observed that each section of the warp-beam can be filled independently and the same can be used from independently. The sections of the warp-beam are filled by clamping each one separately to the shaft L and winding a proper amount of warp onto the same.

In weaving less than the full width of the loom's full capacity the sections of the warp-beam not used are loosened on the shaft L by loosening their set-screws u . They will then not revolve with the remainder of the sections, and the warp will of course not be drawn off, and thereby a great saving of material will be effected, it being possible to weave a breadth of any desired width without any waste and without specially winding the warp on the beam therefor. In wide looms the transverse shafts and rods of this structure can be suitably braced to impart rigidity. The warp extends upwardly and rearwardly, thence over a beam at the rear forwardly, through the harness and reed to the breast-beam of the machine, from whence it continues in the fabric down to the cloth-beam below.

Centrally located in the machine is a shaft G , containing oppositely-arranged cranks G' G' G' intermediate its length and toward each end. A vertical frame, consisting of metallic end bars D' D' and top and bottom bars D D , is supported on this shaft G , the said frame being provided with a central bar D'' , which also embraces the shaft. This frame is retained in the vertical position by the rod or link t , extending from the bottom thereof to the rear part of the frame A . The heddles E are supported on upright bars E' , which extend through suitable mortises in the top and bottom bars D of the frame. The bar E' is retained in the mortise by buttons F , pivoted

to said cross-bars, the said bars E' E' being adapted to shift up and down and form the shed in weaving. Each one of these vertical bars E' is connected by a pitman b to one of the cranks G' of the shaft G , the supporting-bars belonging to the one heddle being connected to one set of cranks and those belonging to the other heddle being connected to the oppositely-arranged set of cranks. It will be observed from this that when the shaft G is rotated, owing to the crank connections, the heddles will be reciprocated up and down, their positions being reversed at each half-rotation of the shaft. We effect this half-rotation of the shaft automatically by a connection to the lay of the loom. The lay of the loom is supported on pivots a' on arms a , extending downwardly from the frame B . A rack-bar J is pivotally connected to bracket C' on the under side of the head C of the lay. The rack-bar acts upon a ratchet mechanism to give the shaft a half-rotation when the lay is operated.

On the shaft G at the center we secure a disk N by a suitable key, and on this disk we provide a ratchet-pawl N' , pivoted at n and held normally outwardly by a spring n' . Surrounding this disk N is a shell I , having a cap O for completely inclosing the same. The interior of the shell I is provided with inwardly-projecting ratchet-teeth r to engage the pawl N' when the shell is rotated or oscillated. The exterior of the shell is circular and is provided with a segment of cog-gears s . There is also a bracket I' projecting from one of its faces radially outward, so that its outer edge is tangential to the periphery of the casing. A laterally-projecting lug I'' is on this bracket, the purpose of which will be hereinafter fully explained. The rack-bar J is provided with a short section of teeth s' on its under surface to correspond to and adapted to mesh with the cogs S on the periphery of the casing, so that in reciprocating the rack back and forth it will only oscillate the shaft through a little more than one-quarter of the rotation. The bar is retained in the engaging position by a guide K , embracing the back of the same, the said guide having a pivotal connection through arms K' K' to the shaft G . The rack-bar J is provided with a guiding-rib J' , containing a notch J'' , through which the lug I'' on the shell I passes to retain the shell in the operative position when not in rotation during the manipulation of the lay, whereby the lay may be given the full stroke and only give the shaft G a quarter-turn, owing to the fact that the shaft is only actuated during a portion of the stroke of the rack-bar J .

To hold the shaft G in position after it has been actuated, we provide a disk H , rigidly secured to the same, which contains four equidistant notches d in the periphery thereof. On the top bar D of the heddle-supporting frame we secure a small bracket with pawls H' H'' , extending downwardly therefrom and po-

sitioned and arranged to engage the notches *d* on opposite sides of the shaft to prevent the rotation of the shaft in either direction.

A pin *e*, however, is provided in the guide K to raise the pawl H' during the back stroke of the lay with its rack-bar J, whereby when the ratchet-pawl N' is engaged on the return stroke the shaft will be allowed to make a quarter-turn, so that when two strokes of the lay are made the heddles will be reversed and another strand of the weft can be put in position, another two strokes of the lay made, when the heddles will be reversed, and another strand of weft can be put in place.

The operation of our improved loom will be readily understood from this description. We desire to state that the features we have shown, while they are especially adapted to the style of loom here indicated, can be utilized with other styles of loom and with looms having different kinds of frames. We desire to state that our improved shifting device can be utilized with heddles otherwise supported and that the manner in which we support the heddles here can be utilized with other shifting devices. Numerous other variations and modifications will readily occur to those skilled in the art to which this invention appertains.

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

1. In a loom, the combination of a suitable framework; the heddle-frames; a shaft having cranks with pitmen connected to said heddle-frames to shift the same on the rotation of said shaft; a disk N secured to said shaft, having a spring-coil N' thereon; a casing surrounding said disk end and having inwardly-projecting ratchet-teeth *r* within the same and a segment of gear-teeth *s* on the outside of the same, with a projecting guide-block I' with lug I'' thereon; a bar C with rack-teeth *s'* thereon adapted to engage the gear-teeth *s*; a guiding-groove J' with notch J'' thereon positioned to receive the lug I'' and a guide K, pivotally embracing the said shaft in the said bar and disk in the operative position whereby the said shaft will be rotated intermittently for a portion of a revolution on each full stroke of the lay; a disk H on the shaft G with notches *d* therein; pawls H', H'' secured to the top bar D of the frame and engaging said disks on the opposite sides of the shaft to prevent its rotation in either direction; and a pin *e* on the guide K, throwing the pawl H' out of engagement to permit the actuating of the shaft and thereby the shifting of the heddles on the return stroke of the lay, all coacting substantially as described for the purpose specified.

2. In a loom, the combination with the hed-

dles of a shaft; oppositely-arranged cranks on said shaft, connected to said heddles to shift the same on the rotation of the shaft; a segment-gear having ratchet connection with said shaft; a rack-bar secured to the lay of the loom and adapted to engage said segment-gear to operate the same intermittently; guides embracing said rack-bar and segment-gear whereby they will mesh with each other and be retained in proper position for engagement after the actuation of the shaft; and detent-pawls to engage each side of said shaft and prevent its rotation in either direction; and a trip actuated by the movement of the lay of the loom for releasing one of said pawls to permit the rotation of the shaft when the lay makes a complete movement, all coacting substantially as described for the purpose specified.

3. In a loom, the combination with the heddles of a shaft; oppositely-arranged cranks on said shaft connected to said heddles to shift the same on the rotation of the shaft; a segment-gear having ratchet connection with said shaft; a rack-bar secured to the lay of the loom and adapted to engage said segment-gear to operate the same intermittently; guides embracing said rack-bar and segment-gear whereby they will mesh with each other and be retained in proper position for engagement after the actuation of the shaft, all coacting substantially for the purpose specified.

4. In a loom, a warp-beam made up of sections shaped like spools, there being a ratchet-wheel and click at one end of each of said sections or spools; a bar extending across the loom and underneath said clicks for releasing the same; a shaft extending axially through said spools or sections; and a set-screw *u* for clamping the said sections to the shaft so that they can be connected to the shaft to be actuated therewith or be left free to revolve upon the shaft as desired, for the purpose specified.

5. A warp-beam for a loom made up in sections; a shaft axially through said sections to which the same can be attached or detached, as desired; and independent ratchet mechanism for each of said sections; and connections extending to the front of the loom for releasing said ratchet as desired, coacting for the purpose specified.

In witness whereof we have hereunto set our hands and seals in the presence of two witnesses.

WILLIAM H. KYNETT. [L. S.]
IRA J. TUTTLE. [L. S.]

Witnesses:

CORNELIA A. PALMER,
SILVIA M. PALMER.