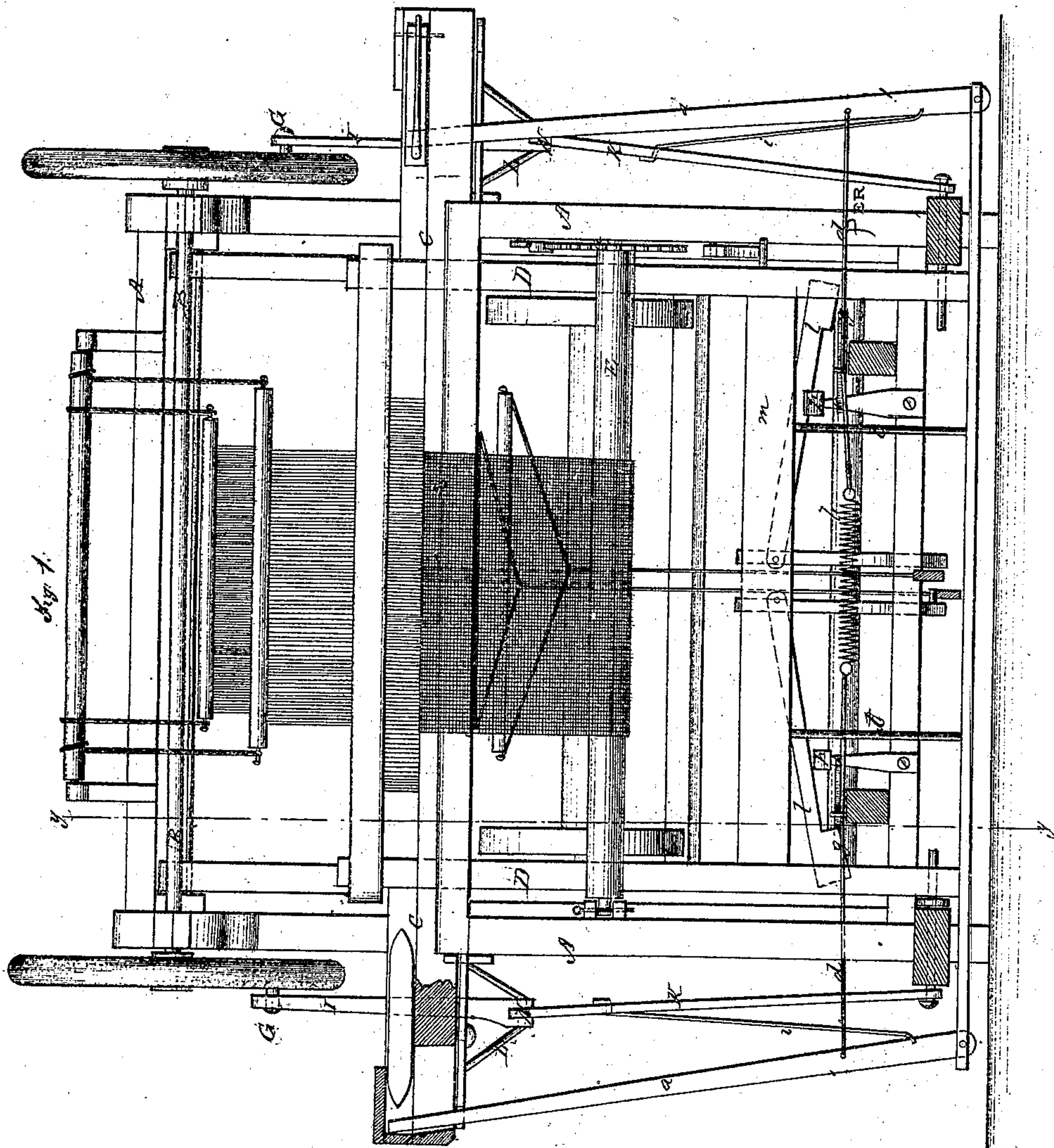


3. Sheets, Sheet 1.

W.R. W.R. & J.A. Giffard,
Shuttle Motion for Looms,
No. 113,202. *Patented Apr. 4. 1871.*

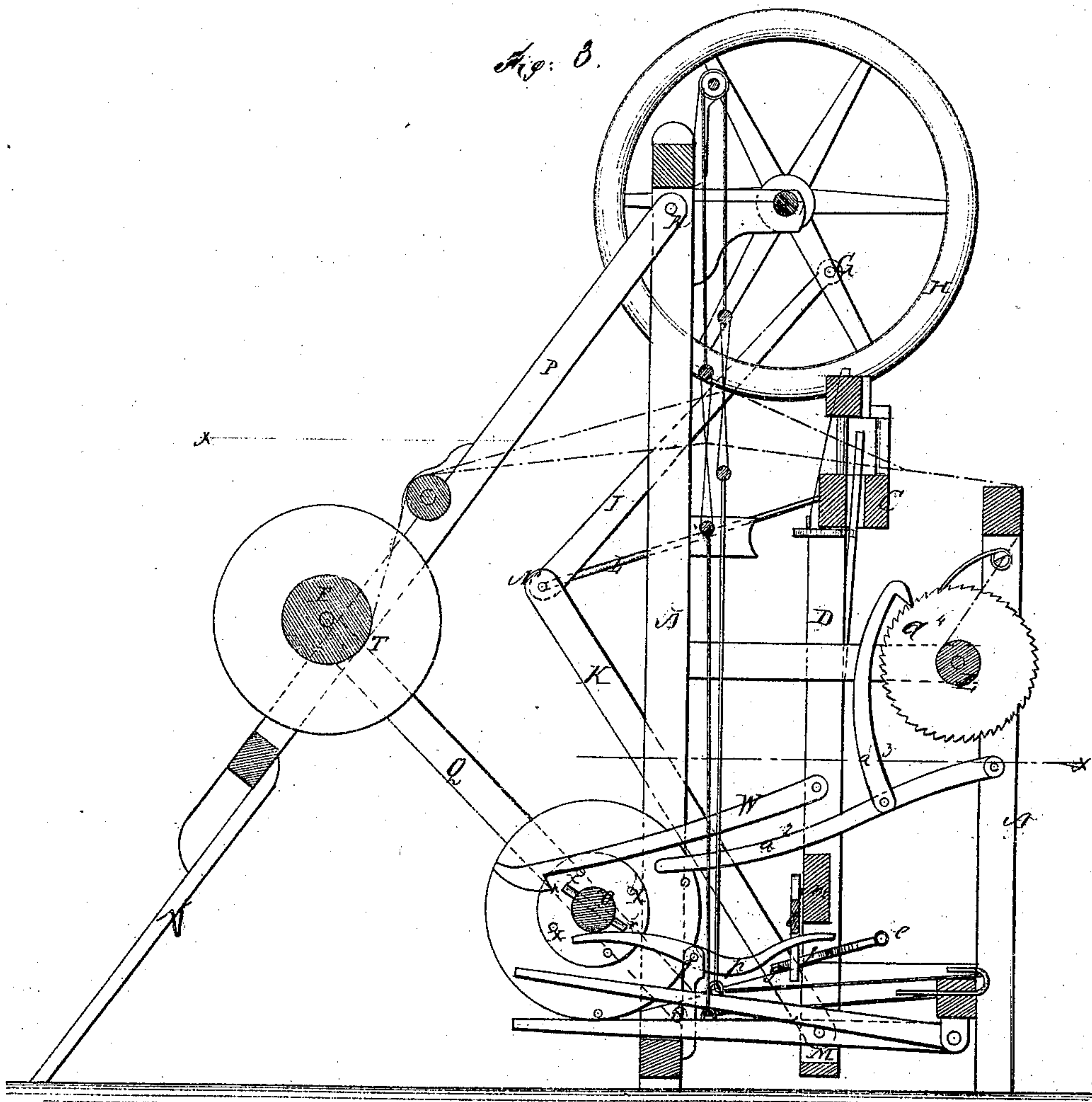


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3. Sheets. Sheet 2.

W. R. W. & J. A. Giffard,
Shuttle Motion for Looms.
No. 113,288. Patented Apr. 4. 1871.



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Shuttle Motion & Loops.

No. 113,288.

Patented Apr. 4. 1871.

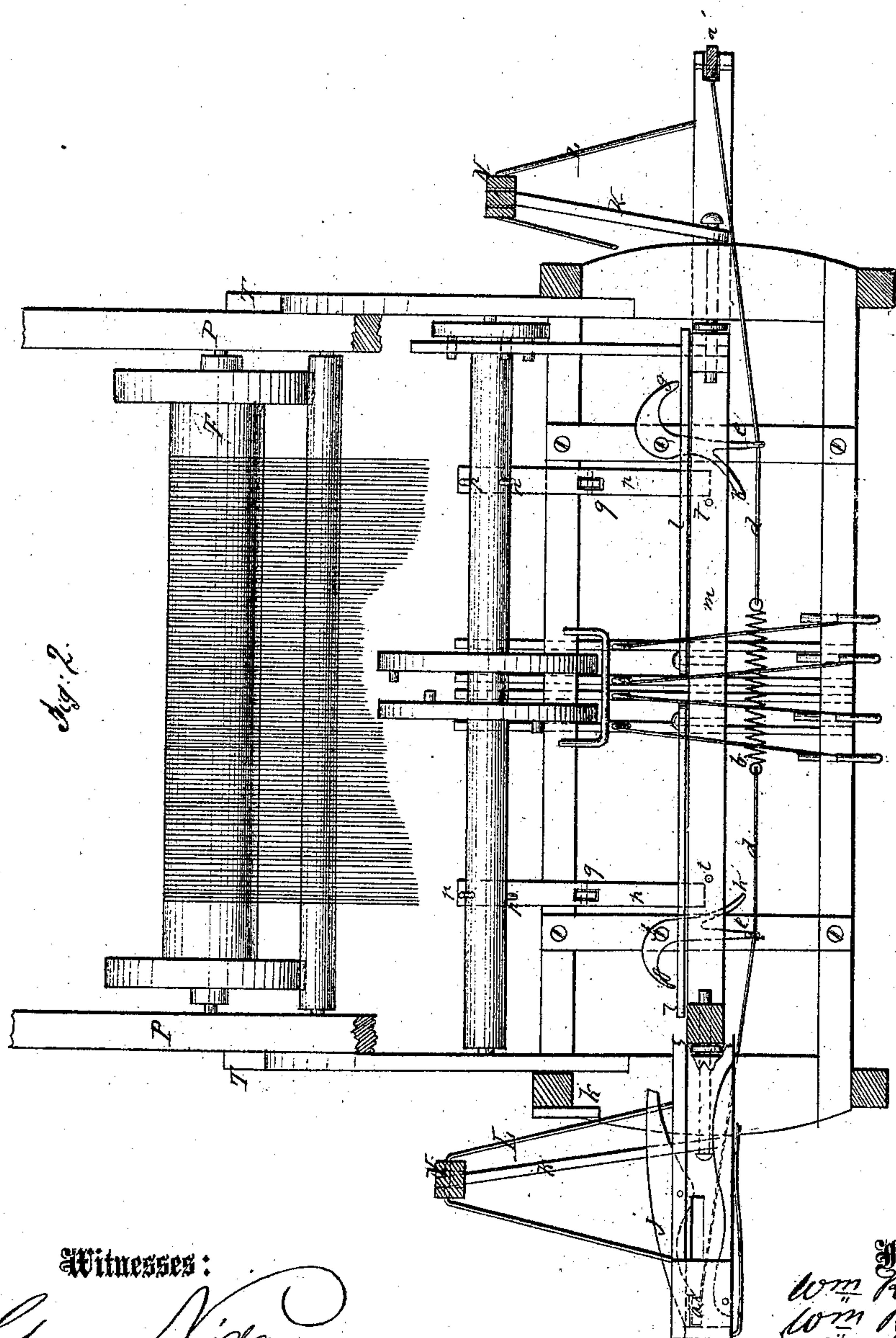


Fig. 2.

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United States Patent Office.

WILLIAM R. GIFFARD, WILLIAM R. GIFFARD, JR., AND JAMES A. GIFFARD,
OF MILO, MAINE,

Letters Patent No. 113,288, dated April 4, 1871.

IMPROVEMENT IN LOOMS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, WILLIAM R. GIFFARD, WILLIAM R. GIFFARD, JR., and JAMES A. GIFFARD, of Milo, in the county of Piscataquis and State of Maine, have invented a new and useful Improvement in Looms; and we do hereby declare that the following is a full, clear, and exact description thereof which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

This invention relates to improvements in hand-loom; and consists in certain novel arrangements of apparatus for setting the spring for acting the picker-staves by the action of the lathe, the same being accomplished during the backward movement, so that on the forward movement the whole power may be applied to the reed "in beating" up.

It also comprises improvements in the part of the frame which supports the cam-shaft and the yarn-beam, calculated to facilitate packing for shipment.

Figure 1 is a front elevation of our improved loom.

Figure 2 is a top view of the same, partly in plane and partly in horizontal section, on the line $x x$ of fig. 3.

Figure 3 is a sectional elevation taken on the line $y y$ of fig. 1.

Similar letters of reference indicate corresponding parts.

A represents the loom-frame;

B, the driving-shaft;

C, the lathe;

D, the sword-arms;

E, the cloth-beam; and

F, the yarn-beam.

In order to economize space between the front and rear of the loom we extend that part of the frame which supports the driving-shaft vertically so as to support it over or nearly over the pivot-joints of the sword-arms, and we connect the crank or wrist-pins G of the balance-wheels H on the said driving-shaft with the lathe by means of the bars I K and the connecting-rods L, the bar K being jointed to the frame at M, and the two bars jointed together at N, where the rods L are jointed to them, and working in the manner of "toggle-jointed" bars. The rods L are connected at the other ends to the lathe. By this arrangement the frame may be made narrower from front to rear than when arranged in the common way.

For economizing space for storing and transporting these looms, we mount the cam-shaft O and the yarn-beam in supporting-bars P Q, pivoted to the main frame at R S, and jointed together at T, so arranged

as to support the said shaft and beam outside of the main frame when adjusted as represented in the drawing, and so that the bars, being unjointed at T, may be either detached from the frame at R S, or be folded up against the frame.

For making these supports more steady, the bars P are provided with extensions U, which rest on the floor and are detachably connected to the said bars P.

The cam-shaft O is operated by the pawl W, pivoted to one of the sword-arms, and engaging with the pins X of a disk attached to the said shaft, all so arranged that the shaft is turned a quarter of a revolution at each forward movement of the lathe.

The picker-staves $a a^1$ are connected to the coiled spring b , stretched between them by cords or wires d , which are connected to the long arms e of bell-cranks, pivoted at f to suitable supports. The short arms turn from the pivots toward the sword-arms of the lathe.

The long arms e have bent prongs h pointing toward the center of the front of the lower frame.

i represents springs arranged in connection with the picker-staves to set them when relieved of the strain of the spring b .

They are held by the notched levers j , and tripped by the levers j striking against the stops k .

For setting one picker-staff and straining the spring b for throwing the other, the short arm g of one of these bell-cranks is caught at each alternate backward movement of the lathe by a drop-pawl, l , pivoted to the beam m , and falling between the sword-arm and the said short arm, so that the long arm is swung around in the direction to set the spring and cause it to pull upon the staff, which is set while it frees the other, so that its spring i will set it. This strain on the spring and the staff which is set, continues until near the end of the backward movement of the lay, when the staff is released by the lever j and thrown forward by the spring b , which is released from the strain caused by the bell-cranks at the beginning of the forward movement of the lathe.

While one bell-crank is being moved in this way by its drop-pawl l , the other pawl l , for the other bell-crank, is kept out of action by a lever, p , pivoted at q , and actuated by tappets r on the cam-shaft, the tappets being arranged to cause these levers to raise the drop-pawls alternately to correspond with the alternate action required for the bell-cranks.

The bent arms h of the bell-cranks are caused to strike against the rods t at the time the staves are to be set by the springs i , to prevent any resistance the spring b might make to the setting of the staves.

The cloth-beam is operated by a weighted lever, a^2 ,

pawl a^3 , and ratchet a^4 , the pawl-arm being raised by a stud-pin on one of the sword-arms moving under the inclined arms a^2 .

Having thus described our invention,

We claim as new and desire to secure by Letters Patent—

1. The combination, with the spring b and the lathe, of the bell-cranks and drop-pawls ll , when arranged for setting the spring while the lathe is moving backward, substantially as specified.

2. The combination, with the drop-pawls and the bell-cranks, of the levers p and tappets r , the latter being on the cam-shaft, and arranged for operating the said levers alternately, substantially as specified.

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