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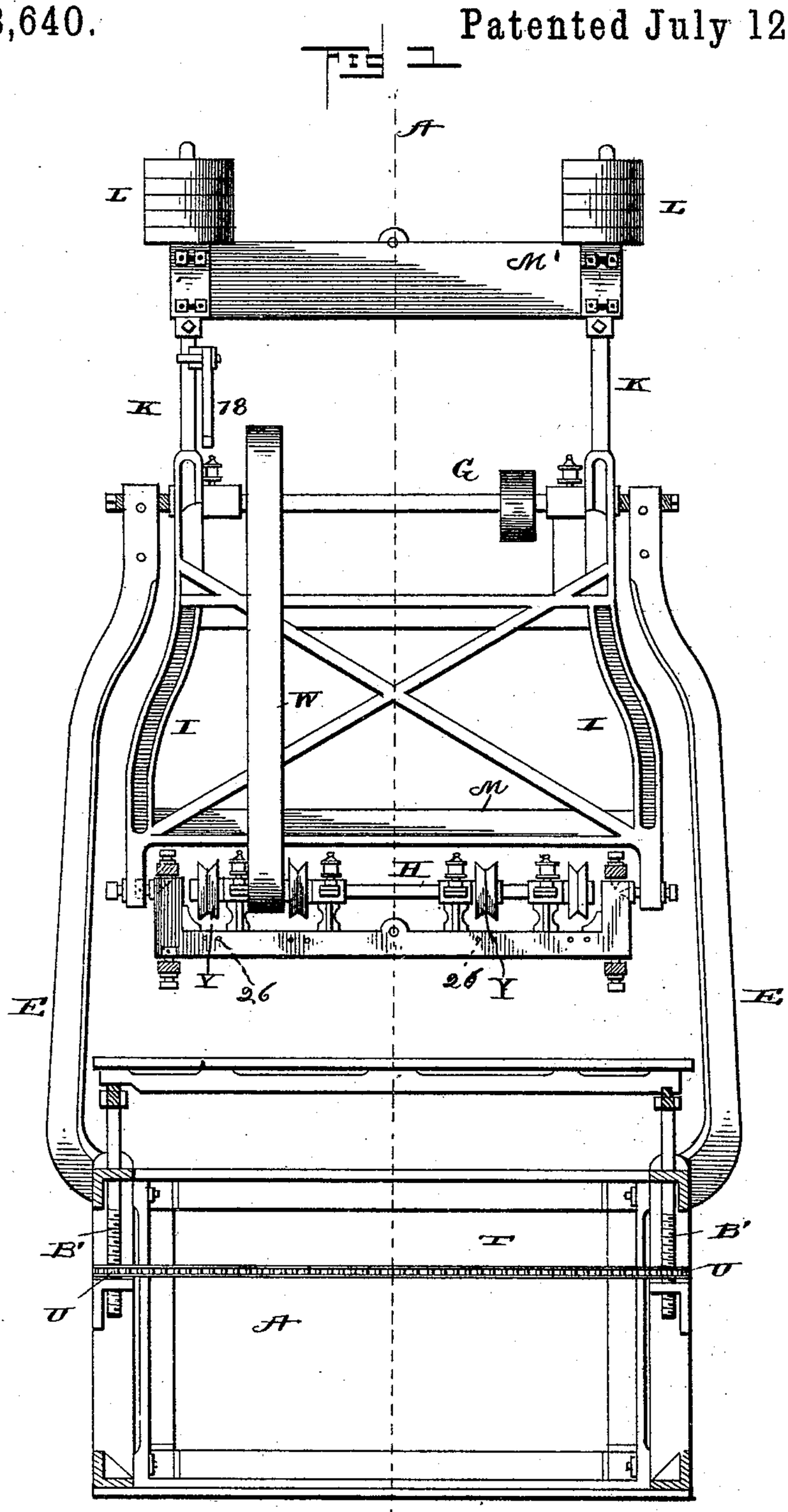
J. ROHLMANN.

CARVING MACHINE.

No. 478,640. Patented July 12, 1892.



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(No Model.)

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J. ROHLMANN.

CARVING MACHINE.

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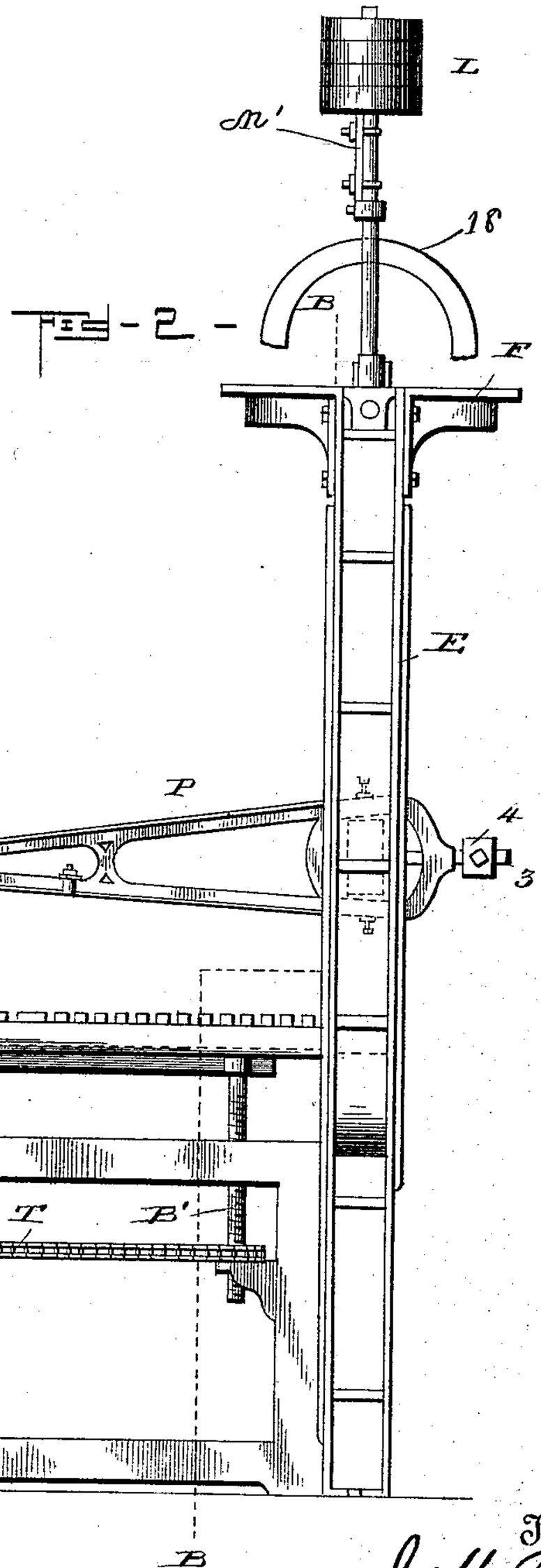
FIG. 2.



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(No Model.) 7 Sheets—Sheet 3.

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Fig 13

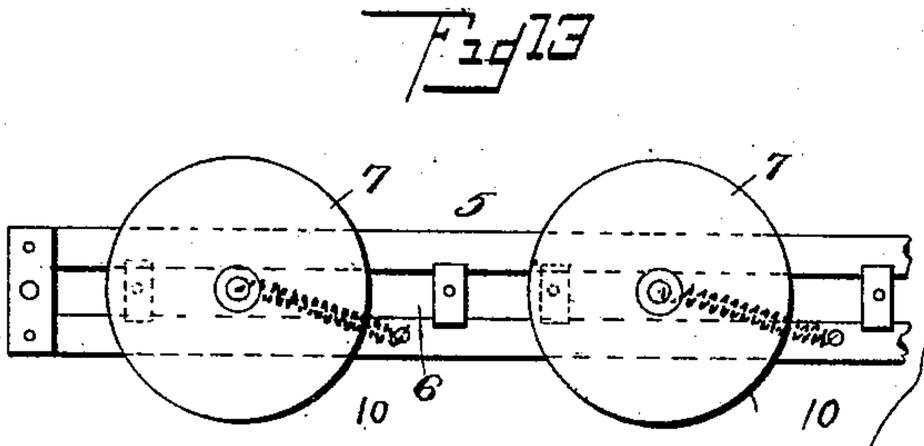


Fig 4

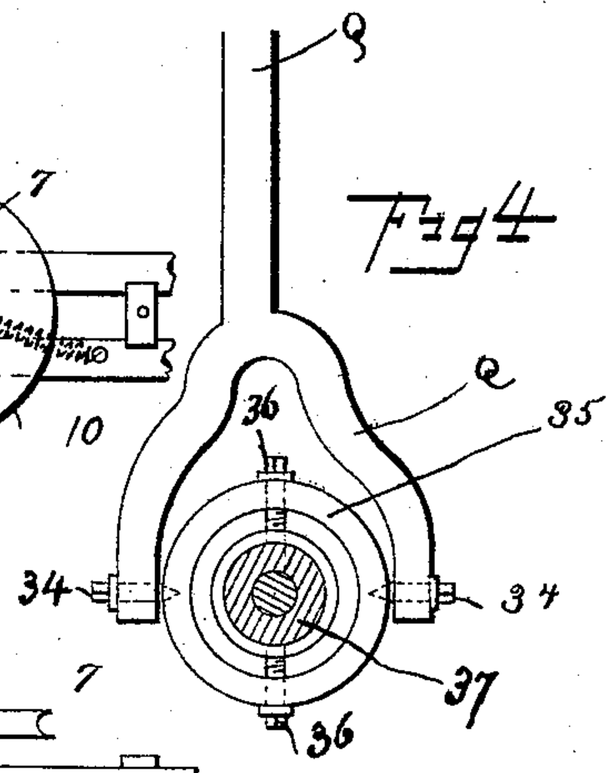


Fig 14

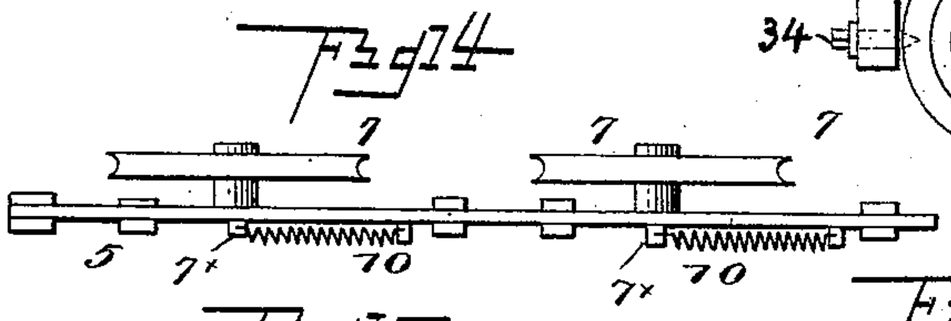


Fig 15

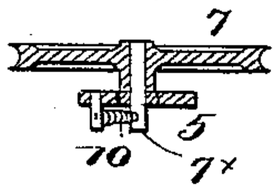
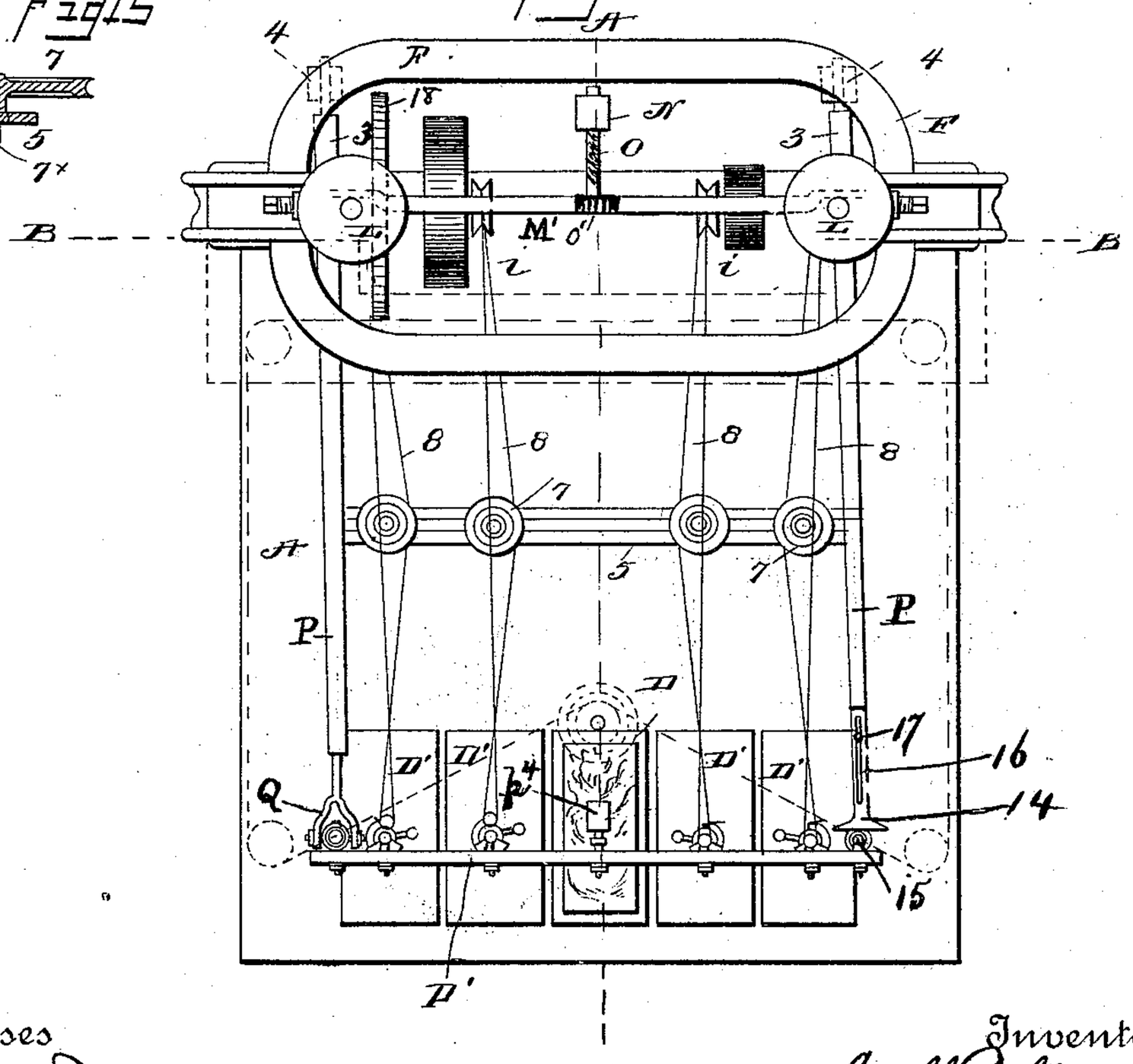


Fig 3



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(No Model.) 7 Sheets—Sheet 4.

J. ROHLMANN.

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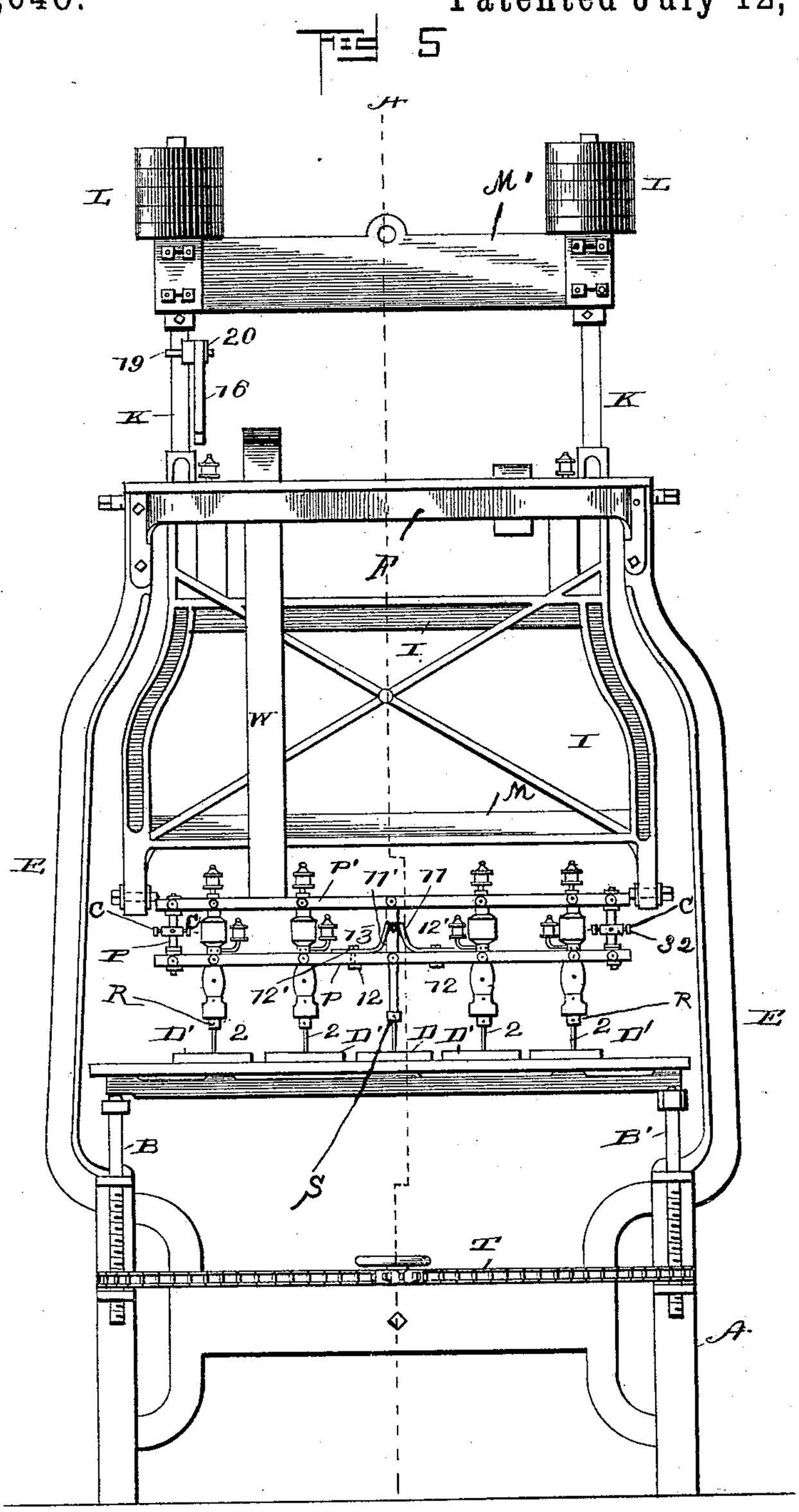
FIG 5



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(No Model.) 7 Sheets—Sheet 5.

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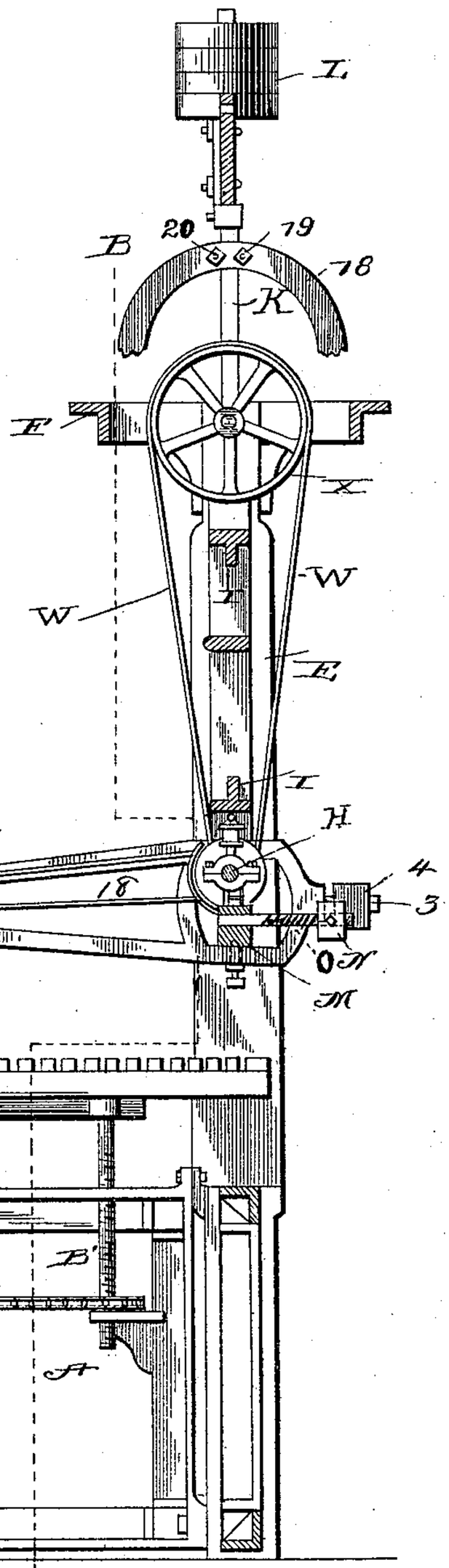
Fig. 6.



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7 Sheets—Sheet 6.

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CARVING MACHINE.

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Fig 7.

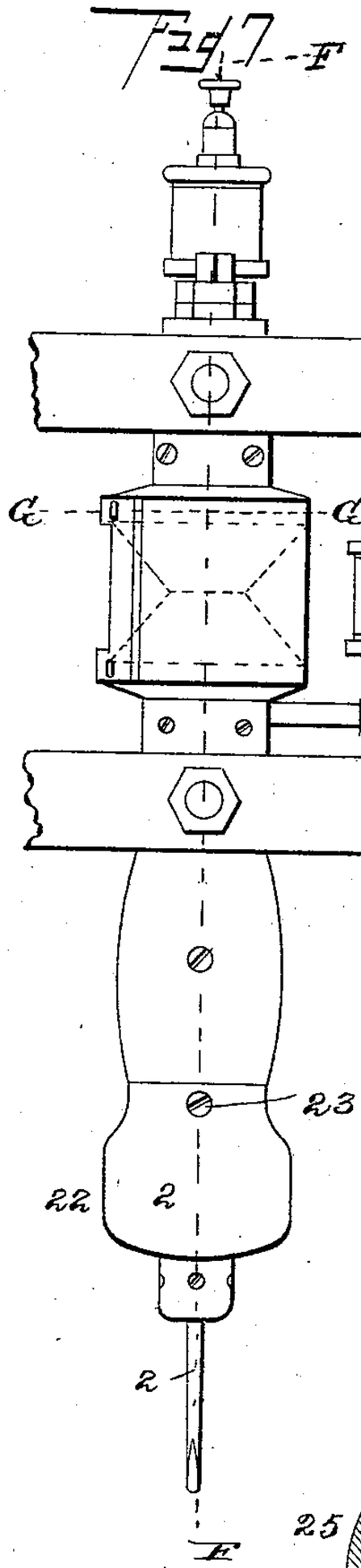


Fig 8

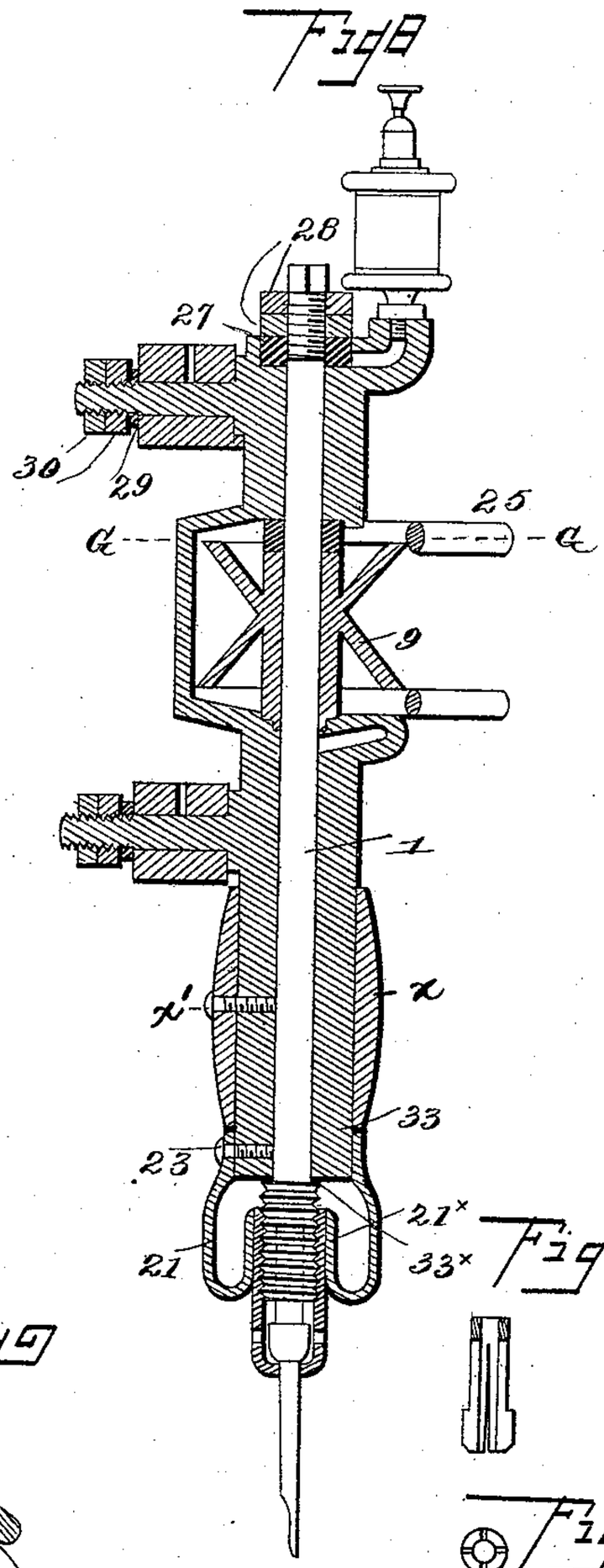
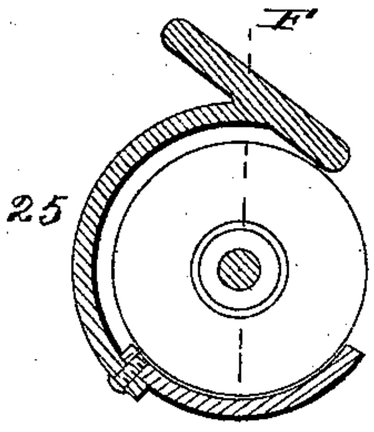


Fig 10

Fig 11

Fig 9



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(No Model.) 7 Sheets—Sheet 7.

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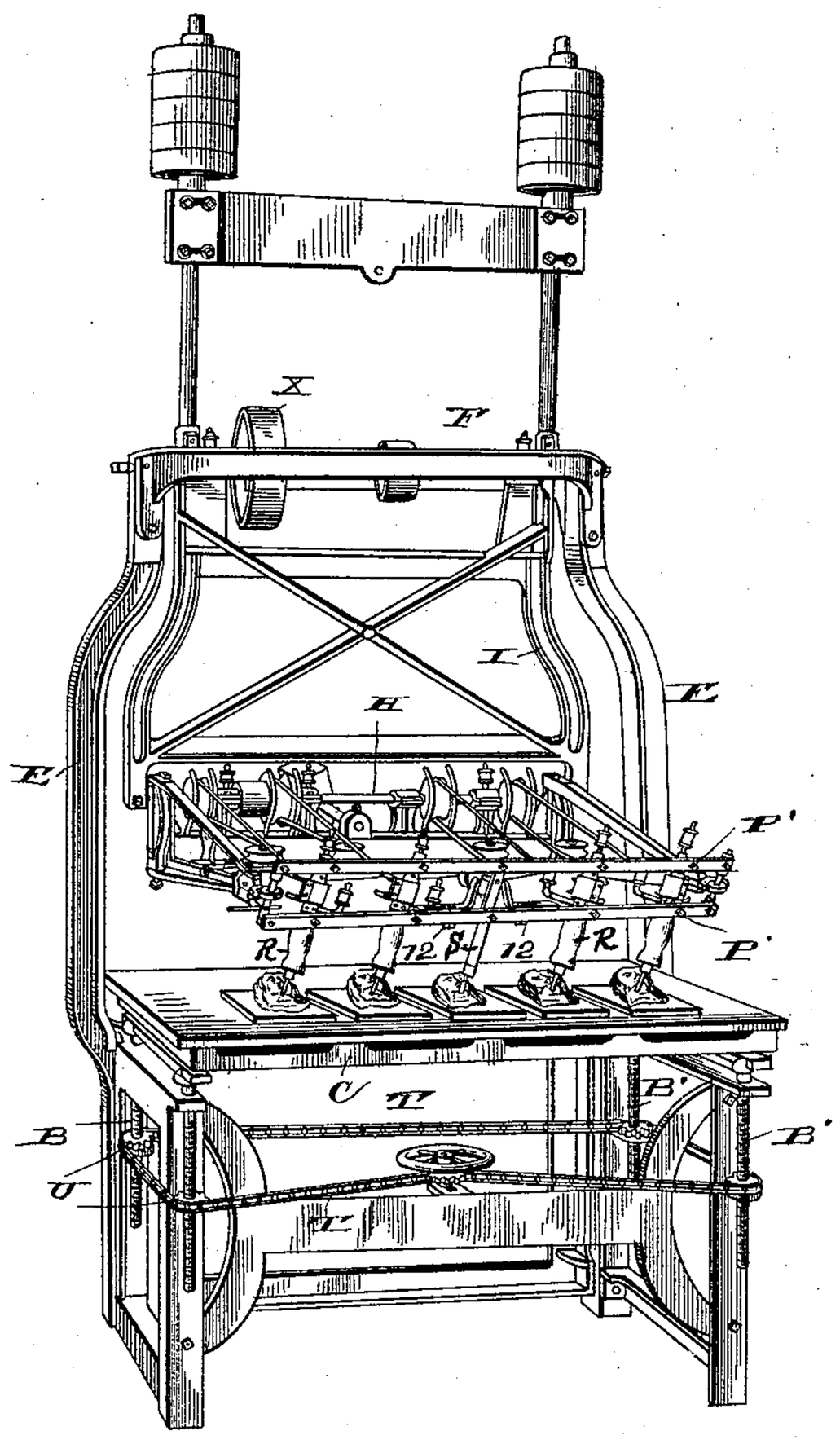
Fig 12



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UNITED STATES PATENT OFFICE.

JOSEPH ROHLMANN, OF ST. JOSEPH, MISSOURI.

CARVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 478,640, dated July 12, 1892.

Application filed May 25, 1891. Serial No. 394,058. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ROHLMANN, of St. Joseph, in the county of Buchanan and State of Missouri, have invented certain new and useful Improvements in Carving-Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form a part of this specification.

My present improvements are intended to make carving-machines more efficient and complete, and, while applicable to carving-machines in general, I will illustrate and describe them with reference to those of a type substantially such, as to the main features, as is shown in my patent, No. 444,306, dated January 6, 1891.

My invention relates to an improved means for checking vibrations by employing a system of balance-weights, and which improvement also serves to render the machine more compact, to a special means for automatically tightening the belts which operate the cutting-tools, to means for bracing the tracing-tool firmly and preventing the wabbling of the cutting-tools at whatever inclination or angle they may be set, to special means consisting of sliding gages on the spindle fastened on the bracket-arms for the purpose of holding the cutting-tool bearers at any desired angle or inclination, to a means for stopping or limiting the forward-and-back movement of the swinging frame, to an improved means for preventing the oil used for lubricating the spindles from dripping upon and soiling the blocks while being carved, and in other particulars hereinafter stated.

In the drawings, Figure 1 represents a vertical section of a machine in the line B B of Figs. 2, 3, and 6; Fig. 2, a side view; Fig. 3, a partial top or plan view; Fig. 4, a detail, enlarged, of one of the spindle-guides and showing, also enlarged and partly in section and on the line C C of Fig. 5, the devices by which the spindle is supported therein; Fig. 5, a front view, some of the rear parts shown in the other figures being omitted to avoid confusion of parts; Fig. 6, a vertical section through the line A A of Figs. 1, 3, and 5; Fig. 7, a front elevation, enlarged, of one of the spindles; Fig. 8, a vertical central section of the same through the line F F of Fig. 7; Fig. 9, a section through the line G G of Figs. 7 and 8; Fig. 10, a vertical section, and Fig. 11 an end view, respectively, of the tool-chuck; Fig. 12, a perspective view of a machine, serving to indicate some of the parts in working positions; and Figs. 13, 14, and 15, enlarged top, side, and sectional detail views, respectively, of the belt-tightening devices.

A represents a frame of any suitable kind for supporting the mechanism, and B B′ the screw-rods, each carrying a screw-nut or sprocket-wheel, for raising and lowering the table C, on which are to be supported a pattern D and the blocks D′ to be carved or devices for holding and adjusting such pattern and blocks.

E E are standards at the rear of the machine and connected at their tops by an open or oval-shaped cross-piece or frame F. These standards serve to sustain much of the operative mechanism, including the horizontal shaft G, the swing-frame I, the shaft H, hung in the lower part of said frame, the vertical arms K, extending upward from the said frame, and the weights L on said arms, and a lower cross-bar M on this frame I serves not only to connect and brace these arms and steady them and their top weights L, but also to afford a support for a central adjustable balancing-weight N, (see Figs. 3 and 6,) held on a rod O, which projects backward from said cross-bar.

M′ is an upper cross-bar connecting the arms K. The position of the counterbalance-weight N may be regulated by turning it on the screw-thread *o* of the rod. The frame E also sustains the weight of the brackets P, which carry the frames P′, that support the spindle-guides Q and the cutting or carving spindles R and the tracing-spindle S and its tool. T is an endless sprocket-chain, and U U are threaded sprocket-wheels or screw-nuts for the same, and V a hand-wheel for actuating this chain to raise or lower the table C, as needed. An endless belt W extends from and over a pulley X on shaft G and over a smaller pulley on shaft H, this latter shaft carrying the grooved pulleys Y, over which

pass the cords 8, which drive the spindles 1, which carry the cutting-tools 2.

The brackets P, (instead of being suspended at their forward ends from a weight-balanced lever on an overhanging pivoted arm, as in my above-mentioned patent,) it will be seen, are each balanced by a rod 3, extending backward from each bracket and carrying an adjustable weight 4. This construction and the arrangement of the several described weights simplify the machine, render it more compact, less liable to get out of order, and, what is more important, avoid all vibrations when the machine is in operation incident to the use of a long counterbalancing-rod and its adjuncts. They also permit a more ready adjustment in properly balancing the swing-frame and the brackets. By these means the bracket-arms holding the tool-holder and frame will be practically at an equilibrium and the slightest pressure will raise or depress the same at the will of the operator.

My means for automatically tightening the cords or belts which drive the cutting-tools are as follows, referring to Figs. 3 and 6:

A slotted cross-bar 5 rests at its ends on the brackets P in such a way that they can move freely without interference from such cross-bar, and on this bar, which has a longitudinal slot 6 therein for the purpose, I arrange four movable tension-pulleys 7, in contact severally with which bear one of the belts or cords 8 which drive the spindles, these belts or cords being endless ones and each extending from one of the pulleys Y on shaft H to one of the spindle-pulleys 9. (See Fig. 8.) Each of these pulleys is controlled by a spiral spring 10, located at the bottom of bar 5, (see Figs. 13 and 14,) and which is so arranged by attaching one of its ends to the bar and its other end to the journal 7* of the pulley that whenever any one of these belts or cords becomes relaxed or stretched it may be passed over its corresponding pulley and automatically held to a certain tension.

As shown in Fig. 3, the disposition of the belts or cords is such that the spindles at one side of the tracing-tool are driven to the right and those on the other side to the left.

The weights L are in sets, and each of them is severally removable from its respective vertical support, so that any desired number of weights as needed may be employed to facilitate the easy working of the swing-frame I and its connections.

My means for stop-gaging and bracing the central or tracing tool, so that the cutting-tools may be inclined laterally to the desired angle and then fixedly secured, are as follows, referring to Fig. 5: The stop-gages or spindle-guides 11 and 11′ are in two pieces and constitute two separate gages working together. The long arm of each, which is provided with a slot, is adjustably fastened by a bolt 12 and nut 12′ to the top of the lower bar of the frame P′. When it is desired to incline the tracing-tool, and with it the spindle, to one side or the other, the nuts are loosened and the gages moved, one following the other, to the required position, and then clamped or tightened to such position by setting the nuts. An adjustable counterbalancing-weight p^4 (see Fig. 3) is placed back of the tracing-tool, as shown. A somewhat similar sliding gage 14, but different in form, is shown in Fig. 3. This is intended to gage the incline of the cutting-tools and of the frame P′ and to hold the adjusted parts firmly to their adjusted position, the spindle-stock passing through an eye 15 in the front end of this guide or gage and the gage being secured by its slot 16 and by adjusting-screw 17 to the bracket P.

To incline the cutting-tools backward at a desired angle, the gage 14 on top of the bracket is pushed forward, adjusted, and secured, and a similar gage (not necessary to be shown) on the bottom of the bracket is drawn backward, adjusted, and secured, so that a line drawn along the ends of both will make the required angle of inclination. The tool-carrying frame is then held to this angle as long as may be needed or until another adjustment.

My means for limiting and controlling the forward-and-back movement of the swing-frame I are shown in Fig. 6, and are as follows: An arched piece 18, which I style the "weight-guider," is bolted, as shown, to one of the vertical arms or uprights K of the swing-frame I, and the positions of its ends are such in relation to the cross-frame F that when the frame I is pushed backward or pulled forward during the working of the machine this piece 18 can rock to a given extent only, being positively arrested in such movement in either direction by its ends coming in contact with and resting on the top of the frame F. This weight-guider 18 may be adjusted in its position by means of its clamp 19 and nuts 20, (see Sheet 6,) and to avoid repetition this guide 18 is not shown in the other figures.

My improved device for protecting the work which is being carved from the oil which is so liberally needed for the rapidly-moving spindles (making, say, over thirteen thousand revolutions per minute) is as follows: The oil catcher or cup 21 is made deep and also bulges all around, as seen at 22, and at its bottom is retroverted or turned in upon itself all around to form a tube, as at 21*, and thence extending a considerable distance, but not up to the spindle-stock 33. This oil-catcher is also provided with a set-screw 23, by means of which it may be secured to or removed from the machine for cleaning or otherwise. The handle x is an integral tube or sleeve slipped or slid upon the tool-stock and held thereto by a screw x', and the oil-cup 21 is not (as in my above-named patent) attached to this handle; but it fits snugly upon and is removably screwed directly to the end of the tool-stock itself, and its upper edge abuts closely against the lower edge of the sleeve and at

some distance above such edge. The intense rapidity of the revolution of the spindles tends to throw off the lubricating-oil all around in a circle in a fine almost-imperceptible spray, which I find cannot be taken up by any ordinary drip-cup. Hence I have devised this special construction, the spindle passing through the central tube 21* and the cup arresting and storing all the spray which is laterally thrown off at the place 33*, where the spindle-stock terminates, and before the oil can trickle down the spindle or reach the top of tube 21*. The oil-supply cups 24 and their connections with the spindle-support need not be described.

The belt-guide 25 is shown in section in Fig. 8 through the dotted line F F of Figs. 7 and 9 and in plan view in Fig. 9 through the dotted line G G of Figs. 7 and 8.

In Fig. 1 the dots 26 26 indicates the places for placing appropriate guides for the spindle-driving belts.

In Fig. 8, 27 indicates paper washers, and 28 check-nuts; 29, a leather washer, and 30 30 a pair of check-nuts.

In Fig. 4 is shown on a large scale the universal connection of the cutter-spindles with the brackets, 34 34 being opposite pivots in the yoke of the spindle-guide Q, 35 a ring held by such pivots, and 36 36 other pivots at right angles to pivots 34 34 and serving to hold the ring 35 to the holder 37, in which the tool is held. The adjustable balancing-weight 4, supported on the central rod extending back from the frame, serves as an equipoise measure for the weight of the spindles and to aid in keeping the tracer and cutters close to the work.

It will be evident that if need be other or more in number of balancing-weights may be attached at the rear of the machine.

I claim—

1. In combination with a pendulous swing-frame carrying at its lower end bracket-arms and a set or system of carving-tools, the rearward-projecting arms O and 3, and their adjustable weights N and 4, the combination being and operating as set forth.

2. In combination with the swing-frame and with the spindle-carrying frame, the slotted cross-bar 5 on the latter, provided with the sliding pulleys and spiral springs, substantially as and for the purpose set forth.

3. In combination with the tracing-tool, an adjustable stop-gage composed of two parts, each adapted to be laterally slid and secured and bearing on opposite sides of the stock of the tracing-spindle to hold it firmly in its supports to any position to which it may be set laterally.

4. In combination with the pendulous frame and with the bracket-arms supported on its lower end, adjustable sliding and slotted gages 14, applied as set forth and serving to adjust the tool-stock at any desired forward or backward inclination.

5. In combination with the standards E E, the open or oval-shaped cross-piece on frame F, connecting the tops of these standards, the swing-frame I, uprights K, and the piece 18, secured thereon and serving to limit the swinging movement of the swing-frame by coming into contact with frame F.

6. In combination with arms E and with swing-frame I and uprights K thereon, the arched piece 18, serving to limit the swing of said frame, and the sets of removable adjusting-weights on said uprights, all substantially as shown and described.

7. In combination with the tool-spindle and its stock, the sleeve *x*, beyond which the stock projects, the removable oil-cup 21, fitted upon and secured to such projecting part of the stock and abutting at its upper end closely against the lower end of such sleeve and having the described upward-extending central tube, and the tool-chuck holder fitting closely within such tube, all as set forth.

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