

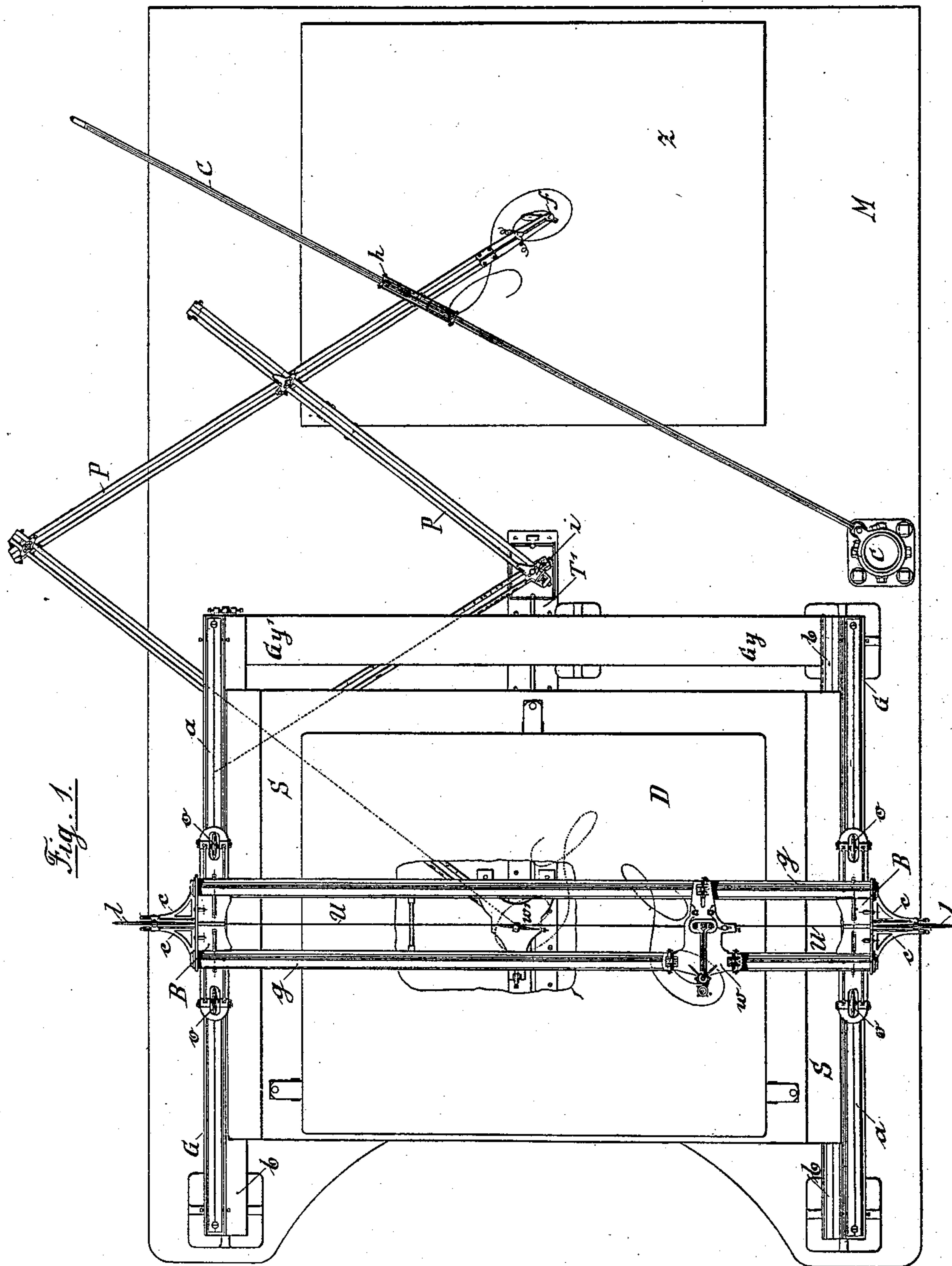
(No Model.)

4 Sheets—Sheet 1.

W. MERL.
ENGRAVING MACHINE.

No. 532,680.

Patented Jan. 15, 1895.



Witnesses:

William Miller

Chas. E. Poore.

Inventor:

Willibald Merz

by Hauff & Hauff,
his attorneys

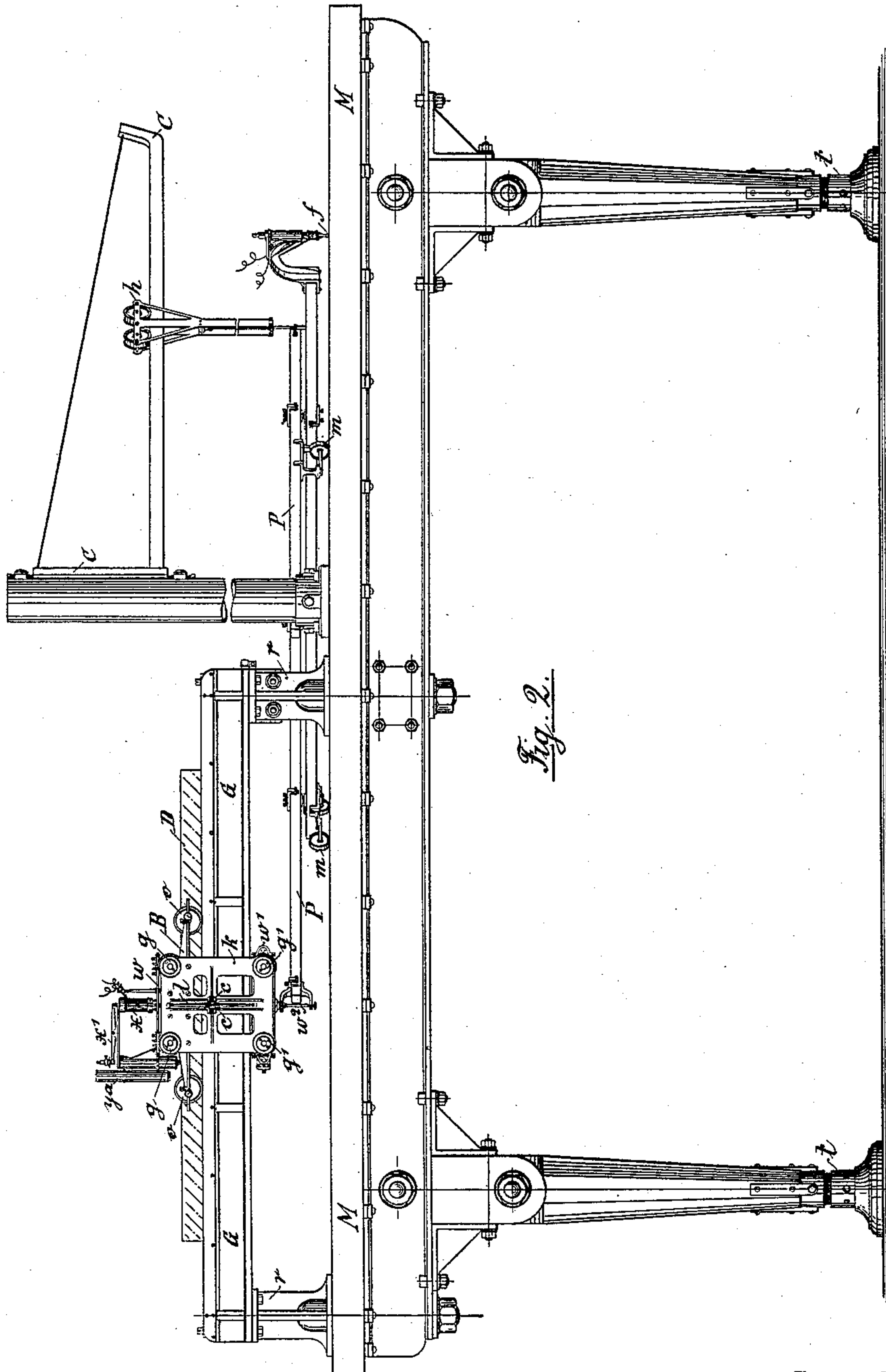
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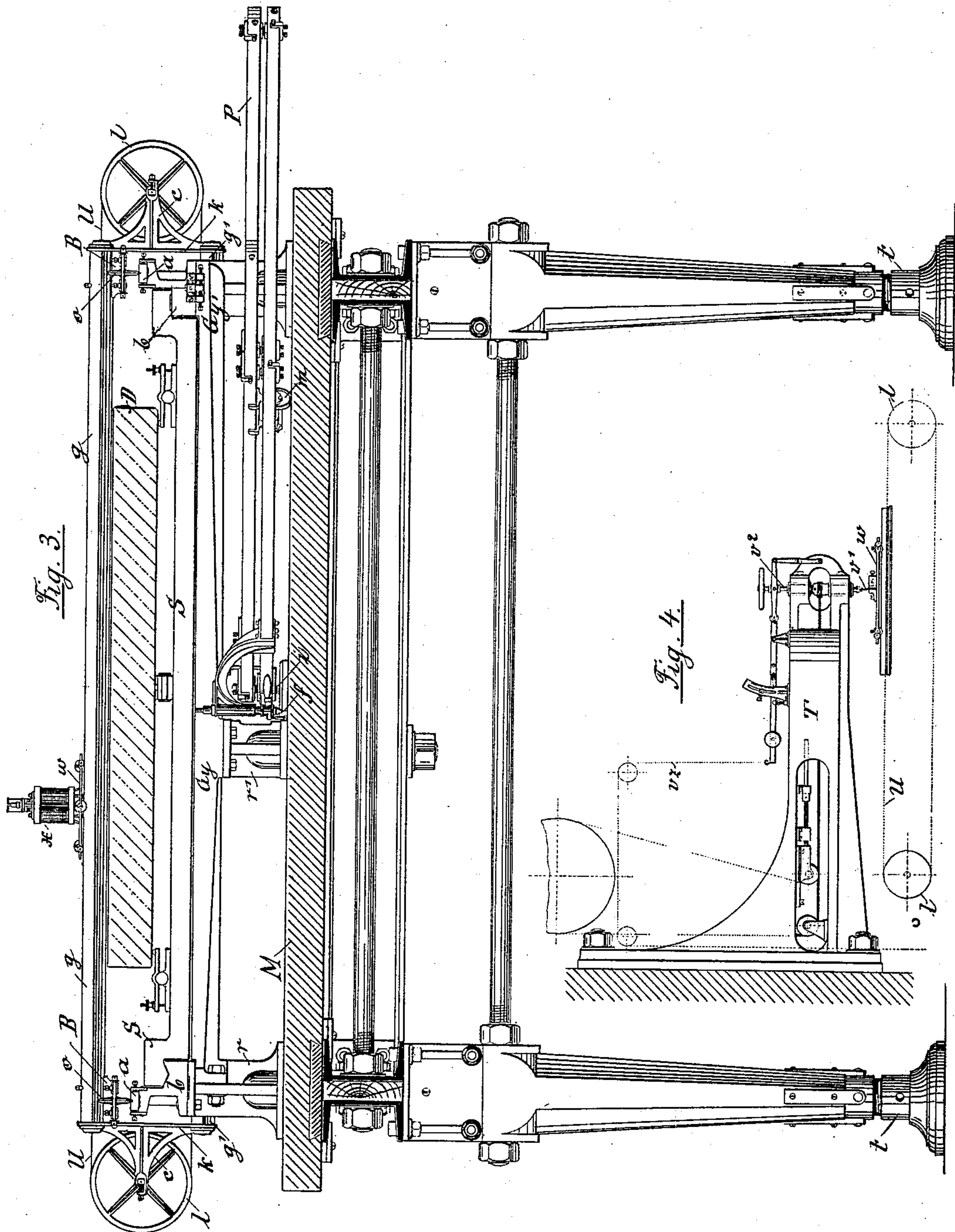
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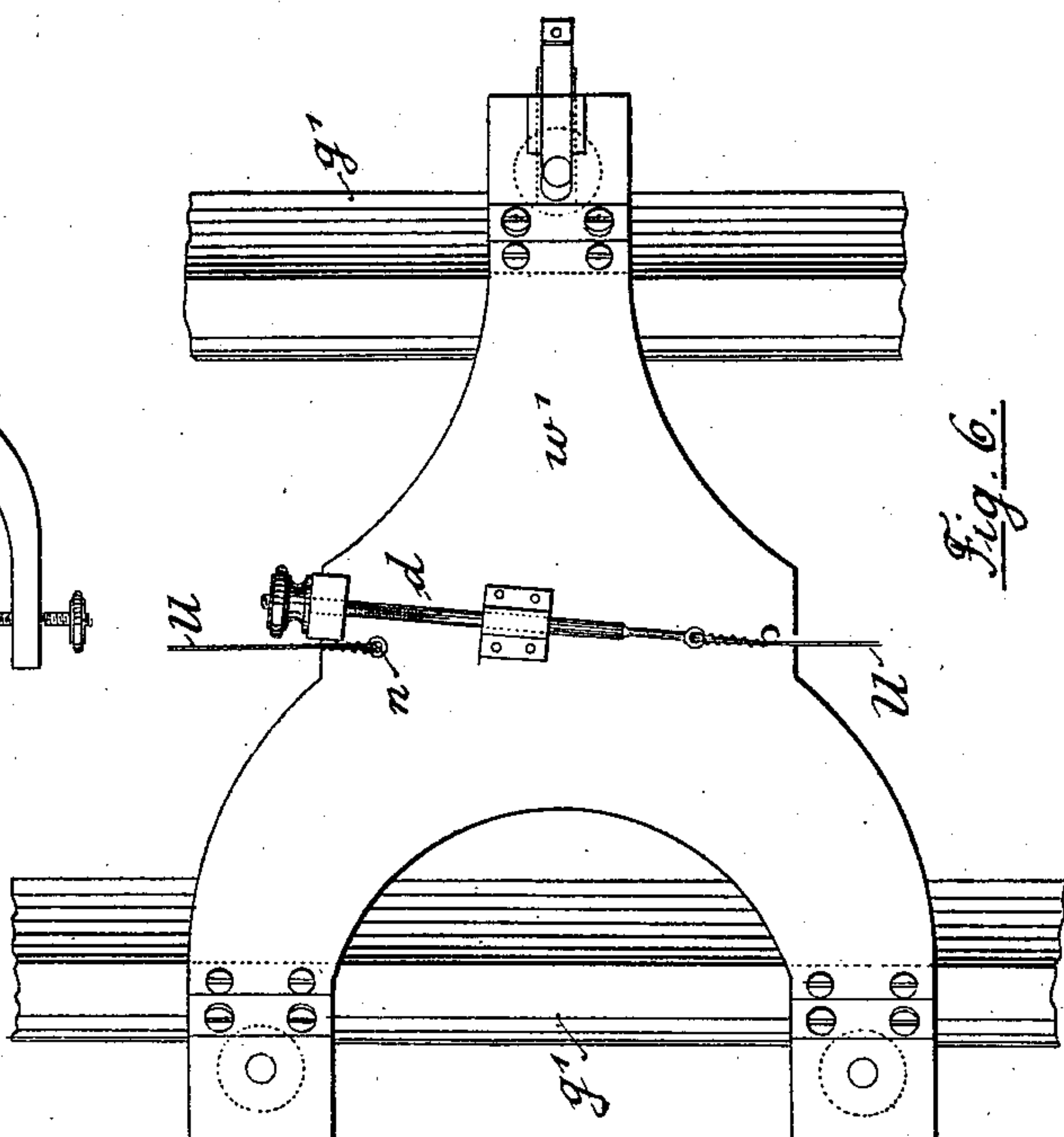
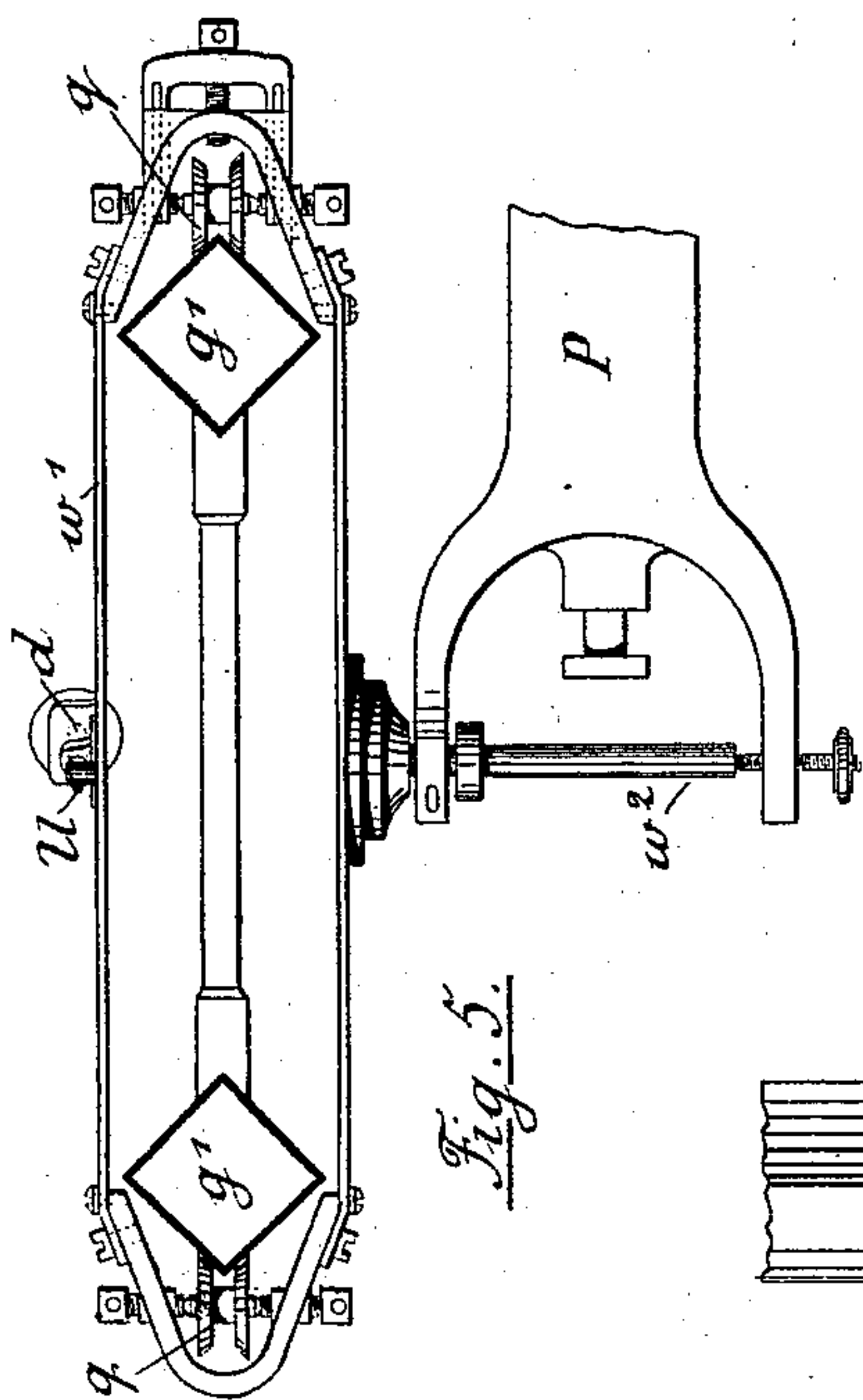
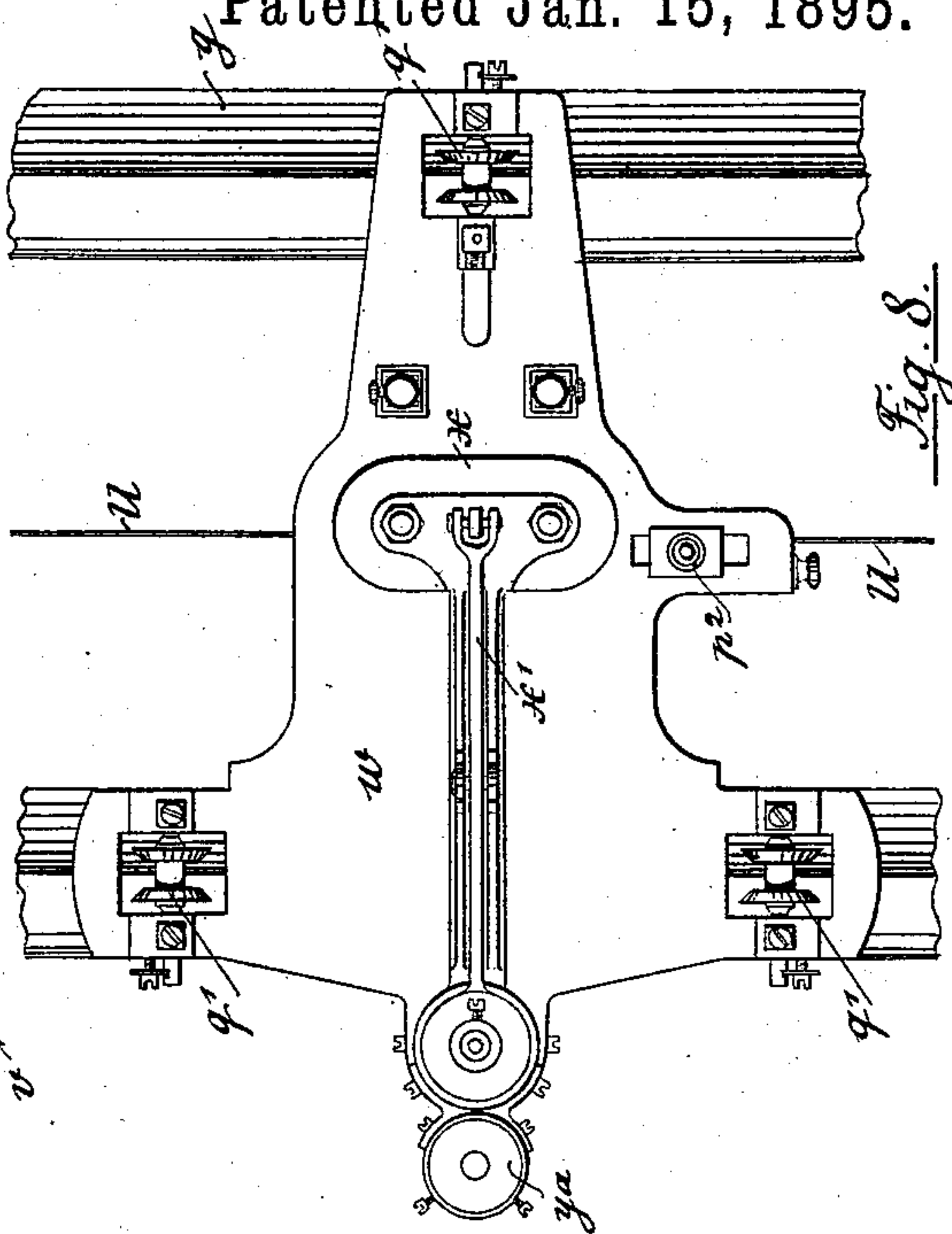
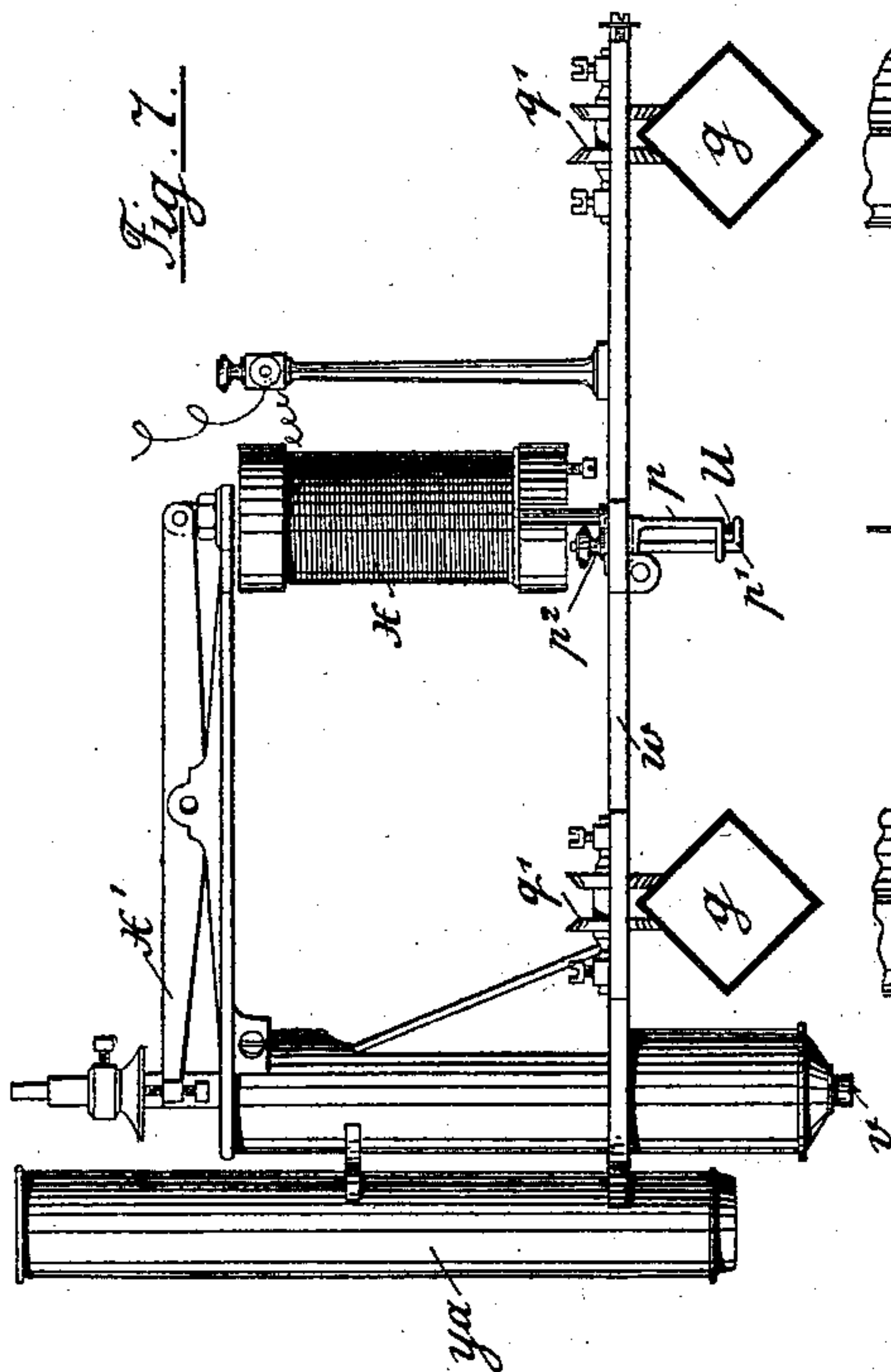
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4 Sheets—Sheet 4.

W. MERL.
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No. 532,680.

Patented Jan. 15, 1895.



Witnesses:

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Chas. E. Pomeroy

Inventor:

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UNITED STATES PATENT OFFICE.

WILLIBALD MERL, OF COLOGNE, GERMANY.

ENGRAVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 532,680, dated January 15, 1895.

Application filed October 18, 1894. Serial No. 526,310. (No model.)

To all whom it may concern:

Be it known that I, WILLIBALD MERL, a subject of the King of Prussia, residing at Cologne, in the Province of Rhenish Prussia, Kingdom of Prussia, German Empire, have invented new and useful Improvements in Graving and Cutting Machines, of which the following is a specification.

This invention relates to a machine, by which the negative of a card, a plan or other drawing can be transferred to printing plates of stone or metal and directly engraved so as to be in condition for printing, or stamps, letters, printing stamps and printing plates and the like can be cut directly into metal according to given patterns.

The invention embodied in the machine is characterized by the combination with a pantograph of a traveling frame having rollers over which travels an endless cord, the upper or oppositely located portion of this cord having a constantly opposite or negative motion being made to actuate a carriage carrying the pricker or tool. The connection between the cord and pantograph is effected also by a carriage, which is rectilinearly guided in the lower part of the traveling frame.

In consequence of the combined movements which the pricker or tool receives in a direction back and forth by the frame and to right and left by the endless cord, the negative of the pattern traveled over by the tracer of the pantograph is directly produced in the plate resting under the pricker or in the blank moved by the upper cord carriage in front of a fixed pricker.

The invention is illustrated in the annexed drawings, in which—

Figure 1 shows a plan view of the machine. Fig. 2 is a longitudinal elevation. Fig. 3 is an elevation sectioned transversely through the machine table. Fig. 4 is a side elevation of a cutting device. Fig. 5 is a side elevation of the lower cord carriage. Fig. 6 is a plan view of Fig. 5. Fig. 7 is a side elevation of the upper cord carriage. Fig. 8 is a plan view of Fig. 7.

The machine table M is stiffened by suitable iron trimmings and can be leveled by its legs provided with set screws *l*. Upon this table on standards *r* rests a frame like sup-

port G, which on the tracks *a a* carries the traveling frame B and between or within it on tracks *b b* the carriage S.

The traveling frame B consists of rectangularly arranged rods *g g g' g'* connected by head plates *k k*, and is provided at its ends in front of said head plates with pulleys *l l* journaled in brackets *c c*, and over which pulleys extends the cord U. The frame is supported in very easy movability on the sharp edged centered rollers *o o* running in furrows of the tracks *a* and between its two upper and the lower rods said frame incloses the carriage S, which serves for the reception of the printing plate D to be engraved. The pantograph P, having its pole at *i*, is arranged under the support G.

The pantograph supported in part on rollers *m*, can be easily moved over the table plate by means of the tracing arm carrying the tracer *f*, said arm being also suspended from a truck *h* traveling on a jib or swinging arm C. To set the pantograph for the various transfer relations the pole *i* can be adjusted on the track T'. To allow free movement of the pantograph under the supporting frame G, one corner G *y'* of the latter is carried free by the arm G *y* resting on standard *r'* placed outside the pole track T'.

Between the lower pair of rods *g' g'* of the traveling frame B travels the carriage *w'*, and on the upper rods *g g* travels the carriage *w*. Both carriages are firmly connected to the cord U and the transfer arm of the pantograph P engages the lower carriage *w'*.

The lower carriage *w'* traveling on roller pairs *q q* is firmly connected to cord U, as seen in Figs. 5 and 6 on larger scale, one end of the cord being tied in an eye *n* of the carriage plate, while the other end is connected to the tension screw *d* placed on the carriage and which screw enables the cord to be brought to the proper tension. The forked end of the pantograph engages a pin *w²* (Fig. 5) secured under the carriage *w'*.

The upper carriage *w* carried by the rollers *q'* (Figs. 7 and 8) is provided with a clamping device, consisting of the arm *p* and the cheek *p'* engaging under the angular end of the arm and which cheek can be set by the screw *p²*. Between the parts *p* and *p'* is

clamped the cord U whereby the carriage is firmly connected to the cord in the adjustment required at the time.

The detachable connection of the carriage, enabling the latter to be connected to the cord in any position on the traveling frame, is necessary for enabling the transfer of drawings of diminished reproduction to be joined to one another. A change of position of the piece to be engraved which may be necessary in the direction at right angles to the travel of the carriage is attained by moving or sliding the carriage S.

To engrave printing plates the upper carriage carries the engraving apparatus with the graver or burin *v*, which as known is actuated by lever *x'* and electromagnets *x*, which are connected by conducting wires with the tracer *f* of the pantograph. For the exact setting of the pricker or graver a sight tube *y a* with a cross of threads is provided, through which the pricker or pencil can be set exactly on the required point of the printing plate where a joining or addition to the drawing has to be made in those cases where several diminished pictures are to be joined to one another.

In the plan view Fig. 1 at one side of the printing plate D is reproduced the negative or reverse representation of a letter on the drawing *z*, such negative being produced when the tracer of the pantograph travels over the picture of the drawing, the traveling frame following the movements back and forth of the connecting pantograph arm, while said arm by means of the cord moves the carriage to the right or left. The movement of the picker resulting from these combined movements produces the negative. To give a view of the lower carriage *w'* the printing plate is broken through at one part and the line of the dotted letter indicates the path described in space by the point connecting the pantograph and carriage.

To use the machine for cutting or shaping, the cord is connected with another carriage traveling on the upper rods, such other carriage having cheeks for clamping the blank. In this case then the blank is moved by the pantograph and the cutter or pricker is in fixed position, being only actuated as required for work and being adjustable in height according to the required depth of the work.

The cutter or shaper can in this case be variously applied and in Fig. 4 is shown an example of a cutting arrangement, the cutter *v'* in a bracket like support being rotated by means of a cord and spindle *v²*. The spindle is vertically adjustable and can be adjusted for the proper working depth of the cutter by a special lever system and at the same time actuated by cord connection *v z*. A pull on cord *v z* will carry the cutter to the blank, while a counter weight will move the cutter away as soon as the cord is released. It is understood, that several stamps of a mark can be cut simultaneously, if several cutting spindles are mounted, as also blanks secured in the carriage *w*.

The pantograph is constructed for transfers equal in size to the original, as also for desired reductions, and can be adjusted to correspond to the required work. The adjustable joints of the pantograph turn in centers and bearings of steel, which material in fact is used for all movable parts of the machine. As for the other parts, especially the traveling frame, aluminium is advantageously employed.

What I claim as new, and desire to secure by Letters Patent, is--

1. A graving or cutting machine comprising a pantograph, combined with a traveling frame provided with pulleys and an endless cord on the pulleys, one portion of the cord being connected to an arm of the pantograph and having its opposite portion provided with a carriage made to travel transversely to the travel of the frame and provided with a pricker or blank substantially as described.

2. A graving or cutting machine comprising a pantograph, combined with a traveling frame provided with pulleys, oppositely located carriages on the frame and an endless cord on the pulleys connected with the carriages, one of said carriages being adjustably connected to the cord, and said pantograph having an arm connected to one of said carriages substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIBALD MERL.

Witnesses:

CHARLES H. DAY,
WM. HAUPT.