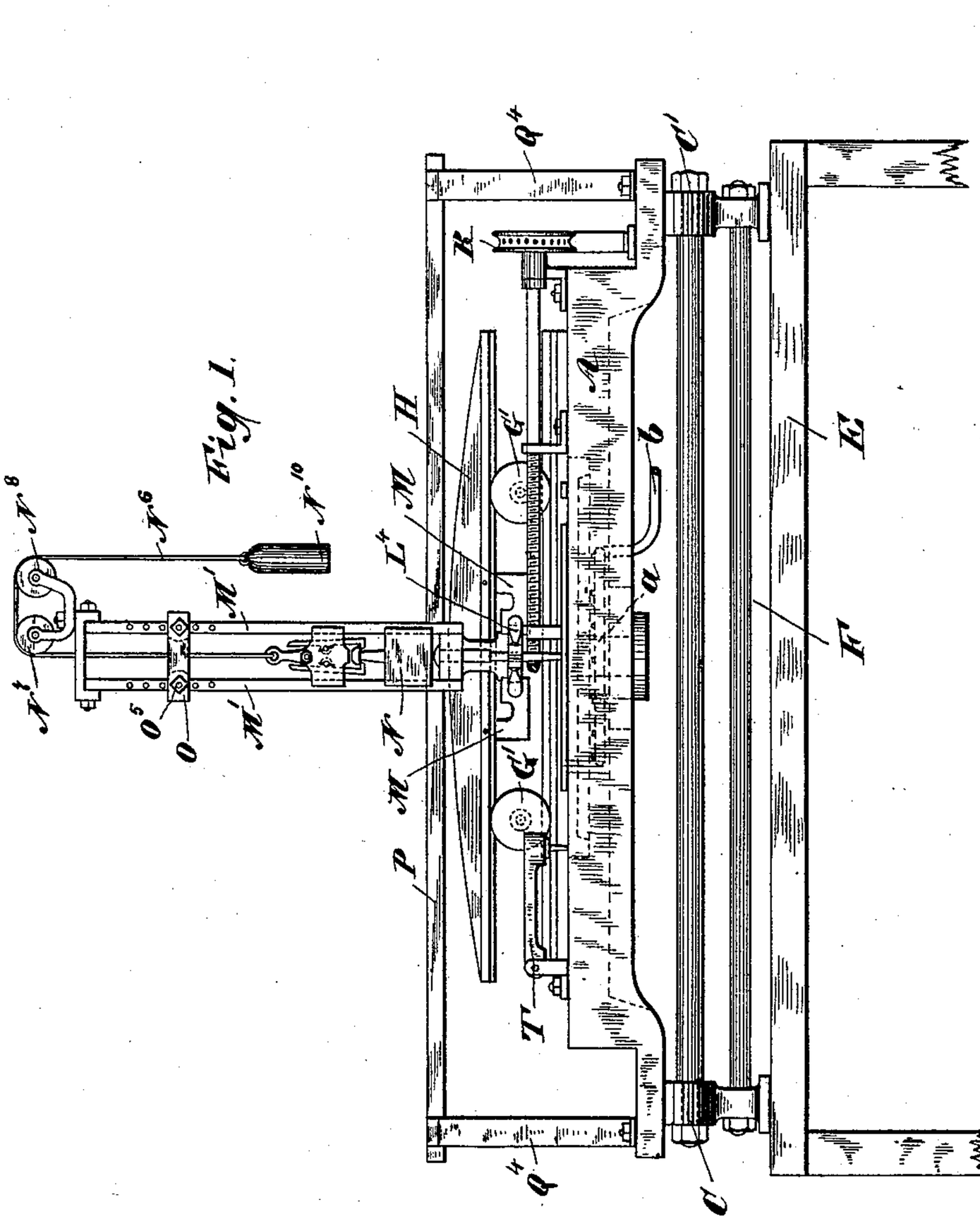
(No Model.) 4 Sheets—Sheet 1.

C. A. KER.

ENGRAVING MACHINE.

No. 477,257. Patented June 21, 1892.

Fig. 1.



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(No Model.) 4 Sheets—Sheet 2.

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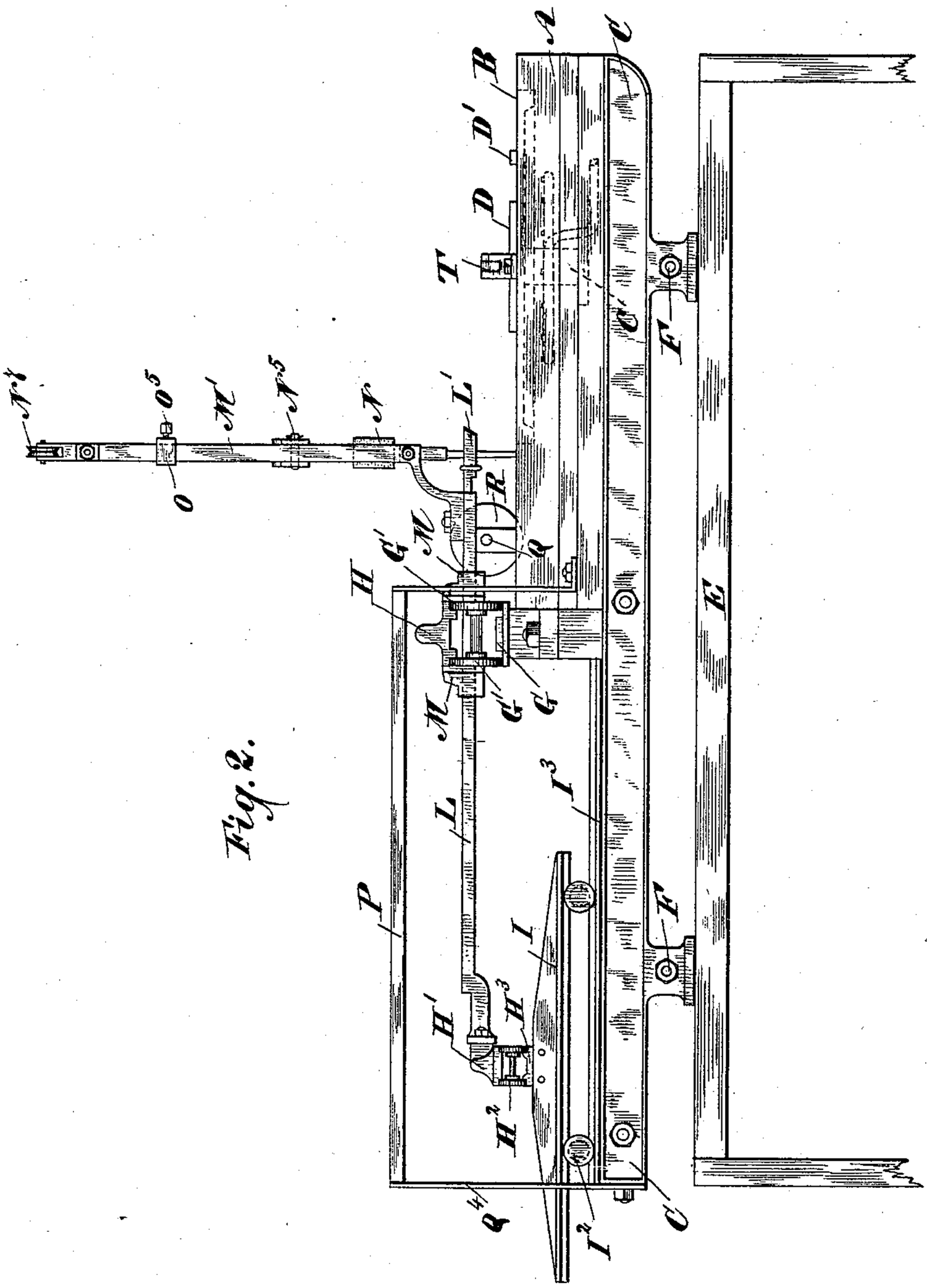

Fig. 2.

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(No Model.) 4 Sheets—Sheet 3.

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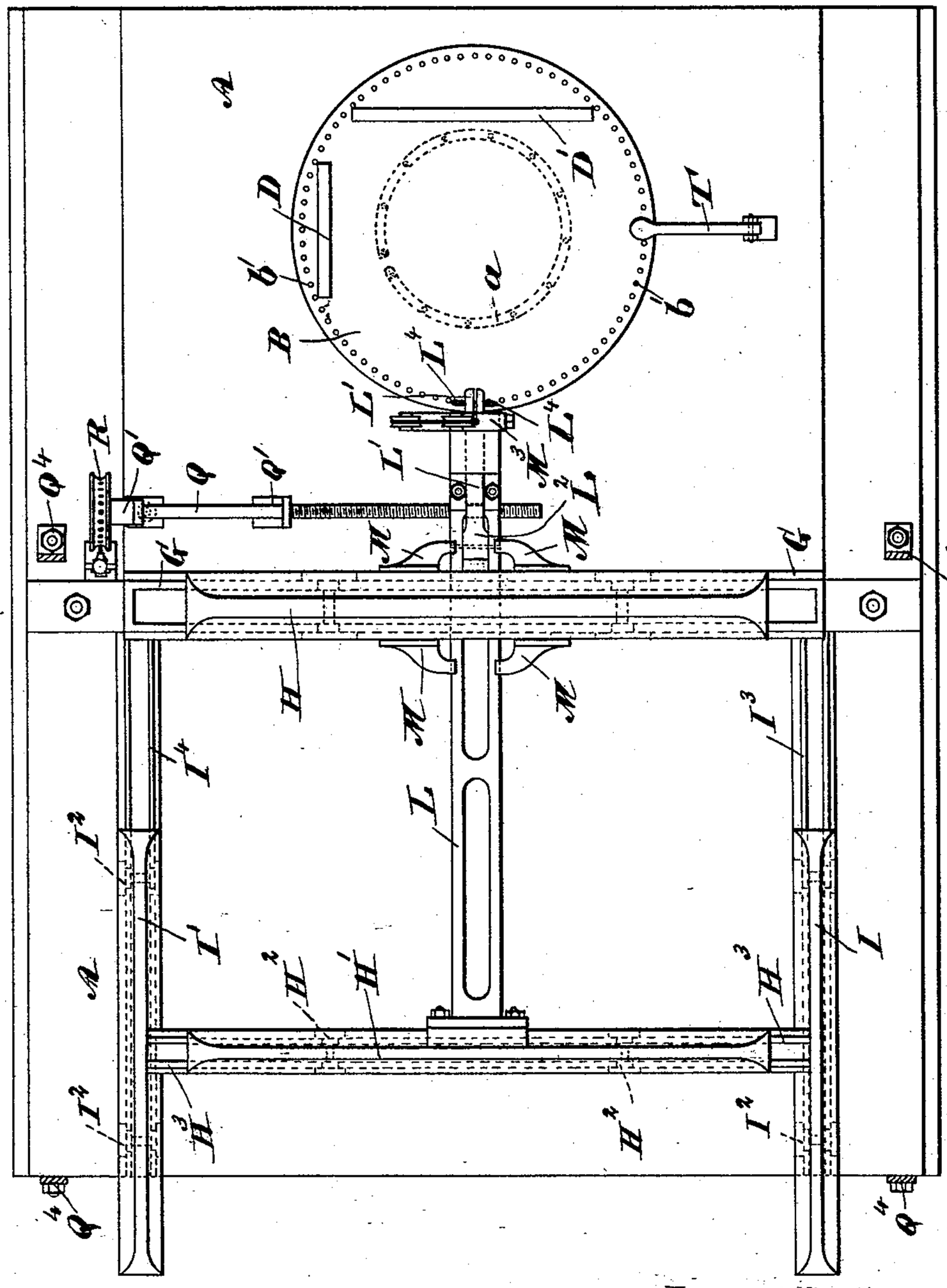
Fig. 3.



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(No Model.) 4 Sheets—Sheet 4.

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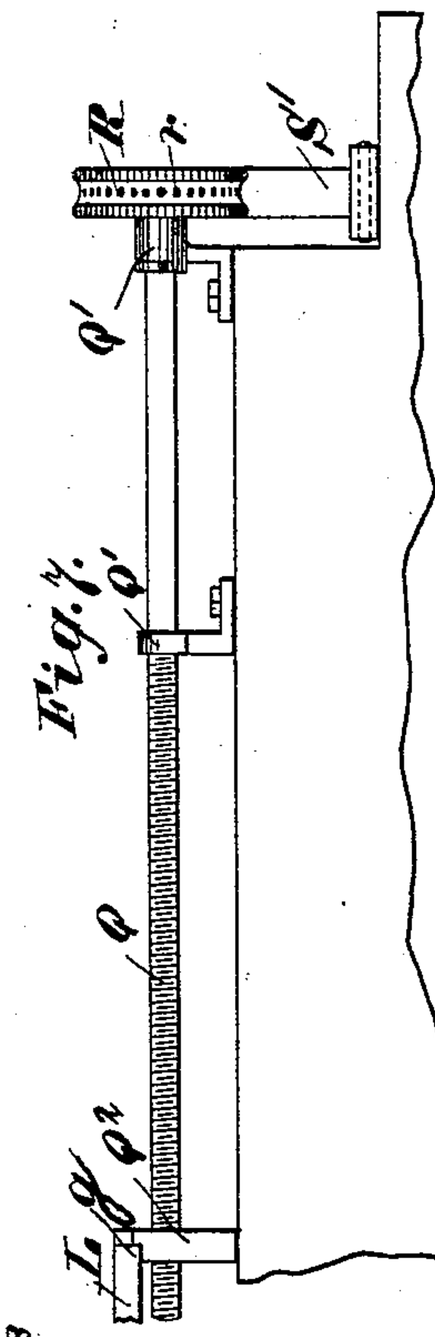

Fig. 7.

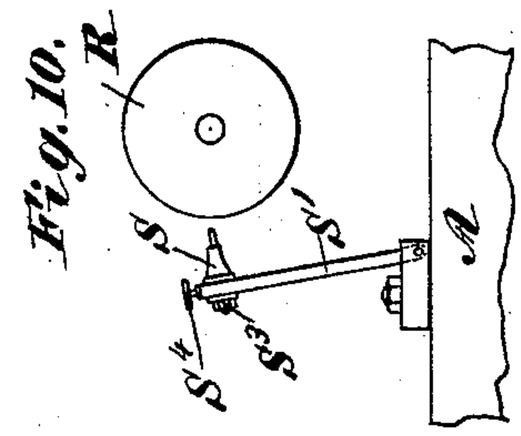

Fig. 10.

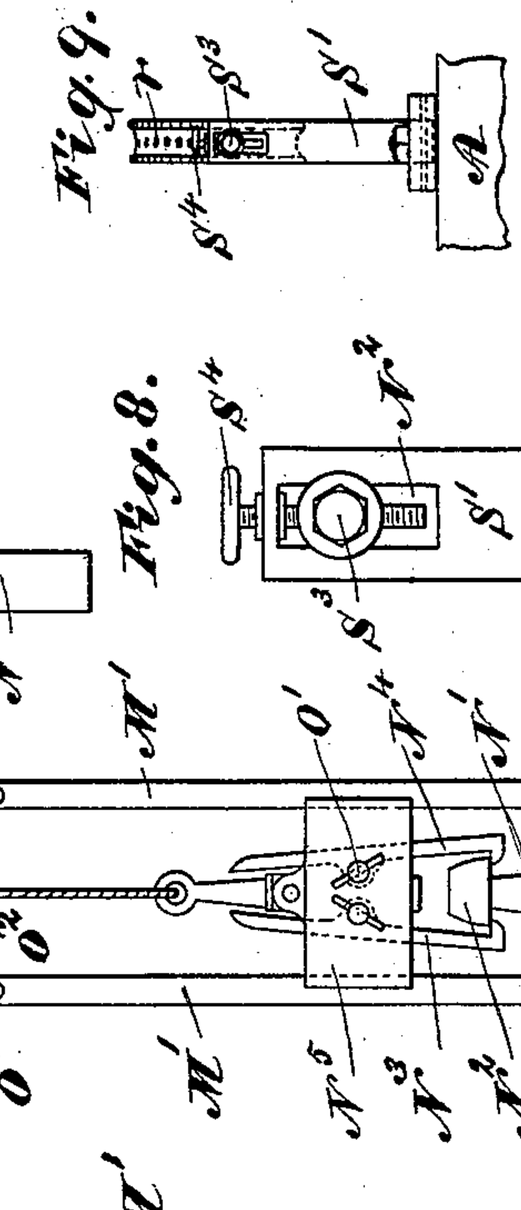

Fig. 9.

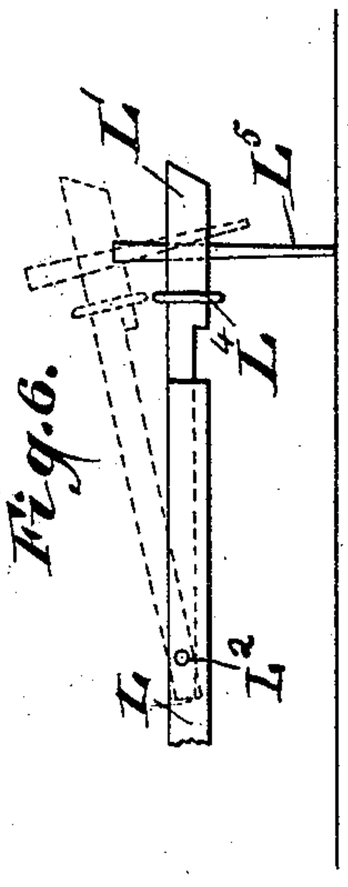

Fig. 6.

Fig. 5.

Fig. 4.

Fig. 8.

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UNITED STATES PATENT OFFICE.

CHARLES ALISON KER, OF GLASGOW, SCOTLAND.

ENGRAVING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 477,257, dated June 21, 1892.

Application filed February 26, 1892. Serial No. 422,865. (No model.) Patented in England April 21, 1891, No. 6,835.

To all whom it may concern:

Be it known that I, CHARLES ALISON KER, a subject of the Queen of Great Britain, and a resident of the city of Glasgow, Scotland, have invented certain new and useful Improvements in Machines for Engraving Music and the Like, (for which I have obtained a patent in Great Britain, No. 6,835, dated April 21, 1891,) of which the following is a specification.

This invention relates to improvements in machines for engraving music and the like; and it has for its object to obviate the necessity for using expensive skilled labor in punching music signs or characters on metallic or other plates, and in order that my said invention may be properly understood I have hereunto appended four explanatory sheets of drawings, whereon—

Figure 1 is a front view of the machine. Fig. 2 is a side view of the machine. Fig. 3 is a plan view. Figs. 4 and 5 are respectively side and front views, to an enlarged scale, of the dumping device. Fig. 6 is an enlarged detail view. Fig. 7 is a side view of an adjusting-screw. Figs. 8, 9, and 10 are respectively an enlarged back view and back and side views of a clamp for the screw.

Referring to the drawings, whereon the same reference-letters wherever repeated indicate like parts, A is a table or bed, which is preferably made of a hollow cast-iron slab. The table has a central circular part B, which is capable of being revolved on a central pivot C, (or it may be on wheels or on a pivot and wheels.)

D D′ are metal strips fixed to the revolving part B. They are for the purpose of keeping the metal plate in place when being punched.

The table A is supported on two girders C′ C′, which may be fixed on a wooden or other support or bench E. The girders are held rigidly together by stays F. At the back of the table A is a cross-rail G, on which runs on pulleys G′ a sideward-traveling bar H. The pulleys G′ are loose and merely serve as rollers. At the back of this bar H is a second sideward-traveling bar H′, which slides on pulleys H^2, running on a cross-rail H^3, carried on top of two back-and-forward traveling bars I I′, sliding on pulleys I^2, which latter run on rails I^3 I^4, supported at the back of the table. The two sideward-traveling bars H H′ carry a central backward and forward sliding bar L. The bar L is secured by studs to the bar H′, and it passes through grooves in four guide-brackets M, secured to the bar H. The bar L carries near its outer end a short lever L′, which is hinged to the bar L at L^2. This lever is capable of being raised vertically. At its end it is split, so as to receive and hold different kinds of punches or cutters for punching the various music-signs on the plate being operated on. The lever L′ has side wings or handles L^4 for enabling it to be operated. (See Fig. 6.)

L^5 is a punch.

Fitted on and projecting over the end of the central sliding bar L is a vertical striker, (see Figs. 4 and 5,) which may consist of vertical guides M′ M′, supported at bottom by the arched bracket M^2 and at top joined together by the bridge M^3 and in which slides a weight N, capable of being drawn up and suddenly let fall, so as to strike the head of the punch L^5 and cause it to punch or cut the desired music or other signs or characters on the plate or piece of card-board held on the table B. The weight N may have a tapered part N′ with a projection or head N^2, which is caught by the two arms N^3 N^4 of a clutch N^5, which latter is pulled or slid up and down the guides by a cord N^6 or equivalent arrangement. The cord N^6 passes over two pulleys N^7 N^8, supported in jaws N^9 on the bridge M^3. The cord may have a counterbalance-weight N^{10} at its end. A collar O, with a central opening O^2, having a cam-surface, as indicated in dotted lines, is carried on the guides M′ M′, which causes the arms N^3 N^4 of the clutch N^5 to release the weight N and let it fall immediately the clutch N^5 reaches said cam-piece. The arms N^3 N^4 are pinned or fulcrumed at O′, and immediately their upper ends enter the opening O^2 of the collar they are, from the shape of the opening, pressed inward at the top, and consequently opened at the bottom, so as to release the head N^2 and let the weight fall and strike the pin O^4, which in its turn strikes the top of the punch. The collar O is adjustable by pinching-screws O^5 to any desired height, so as to

regulate the fall of the weight N. O^6 are holes into which the points of the screws O^5 enter.

For the purpose of drawing correctly and firmly on the plate being engraved the lines or strokes to indicate the different notes—such as quavers, semi-quavers, &c.—I use a regulating-screw and an index. The regulating-screw consists of a screwed spindle Q, Fig. 7, carried on bearings Q′ on the table A and having on it a movable slide or guide Q^2, which presses against the slide L and guides the punch. The guide Q^2 is cut out at *g*, so as to hold against the slide L. The wheel-handle R of the screw has a number of holes *r* in its periphery, which are spaced at equal distances apart from one another. Into any one of these holes the index finger or point S, carried on a hinged arm S′, secured to the machine, can be made to enter. This index-finger S is adjustable in the arm S′. The top of the arm S′ is slotted (see Fig. 8) at S^2, and through this slot the back of the index-finger S projects, being secured or clamped in position by a small screw-nut S^3.

S^4 is a small screw which passes through the back of the finger S, and by turning the screw in one or other direction the index can be adjusted to any desired position in the slot. By turning the wheel-handle of the spindle so many holes and clamping it into position by inserting the index into one of the holes *r*, so as to hold the wheel, lines can be gaged any required distance apart, as the distance of each hole represents a certain travel of the screw Q and slide L. To enable a certain angle to be given to the lines, the revolving table B, which has a number of holes *b*′ in it, is turned round together, with the engraving-plate, until the desired angle is got by means of a hinged finger-catch T, which catches in one of the holes *b*′ and the table B is clamped in position. The angled lines are then easily drawn by pulling out the slide L and drawing the cutting-stylus L^5 over the plate.

To enable the zinc engraving-plate, which is very hard, to be easily worked, I heat it while it is being punched. The heating renders the plate soft and easily punched. The heating may be done by means of steam, hot water, hot air, or by gas-jets or equivalent arranged underneath the table on which the plate is placed. On the drawings I have shown gas-jets *a* as being used. *b* is the gas-pipe.

A wooden cover P, which at the same time serves as a rest for papers, music, &c., is preferably fitted on top of the machine. The cover is supported by four metal standards Q^4. The cover is removed in Fig. 3.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A machine for engraving music, consisting of a table A, with revolving part B and heating appliance under said revolving part, traveling bars H H′ I I′, longitudinal sliding bar provided with a punch, and the striker for striking said tool, substantially as hereinbefore described.

2. In a machine of the character described, the combination of the adjustable frame carrying the punch, means, substantially as described, for operating the punch, and the adjusting-screw Q, with index-pointer S S′ for adjusting said frame and regulating the distance apart of the lines or strokes.

3. In a machine of the character described, the combination of the sliding bar L, having a lever L′ split at its end to receive different puuches, the guides M′, supported on said bar, pin O^4 or its equivalent, striking-weight N, and clutch N^5, operated by a cord or its equivalent, substantially as hereinbefore described.

4. In a machine of the character described, the combination of the table adapted to carry the material to be operated upon, means, substantially as described, beneath said table for heating the same, a punch, and means for operating said punch, substantially as set forth.

In witness whereof I have hereunto signed my name at Glasgow, Scotland, this 4th day of December, 1891.

CHARLES ALISON KER.

Witnesses:
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Patent Agent, Glasgow.
WILLIAM GALL.