

(No. Model.)

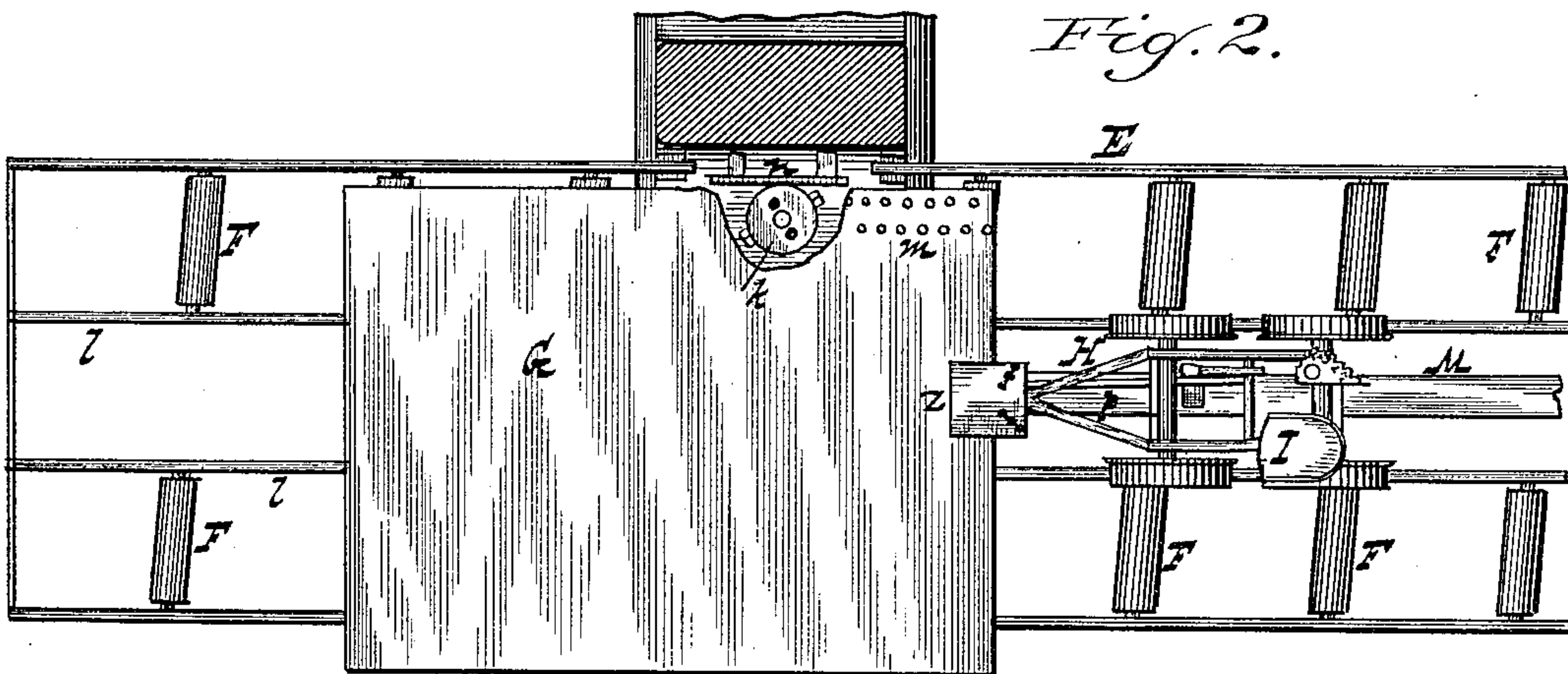
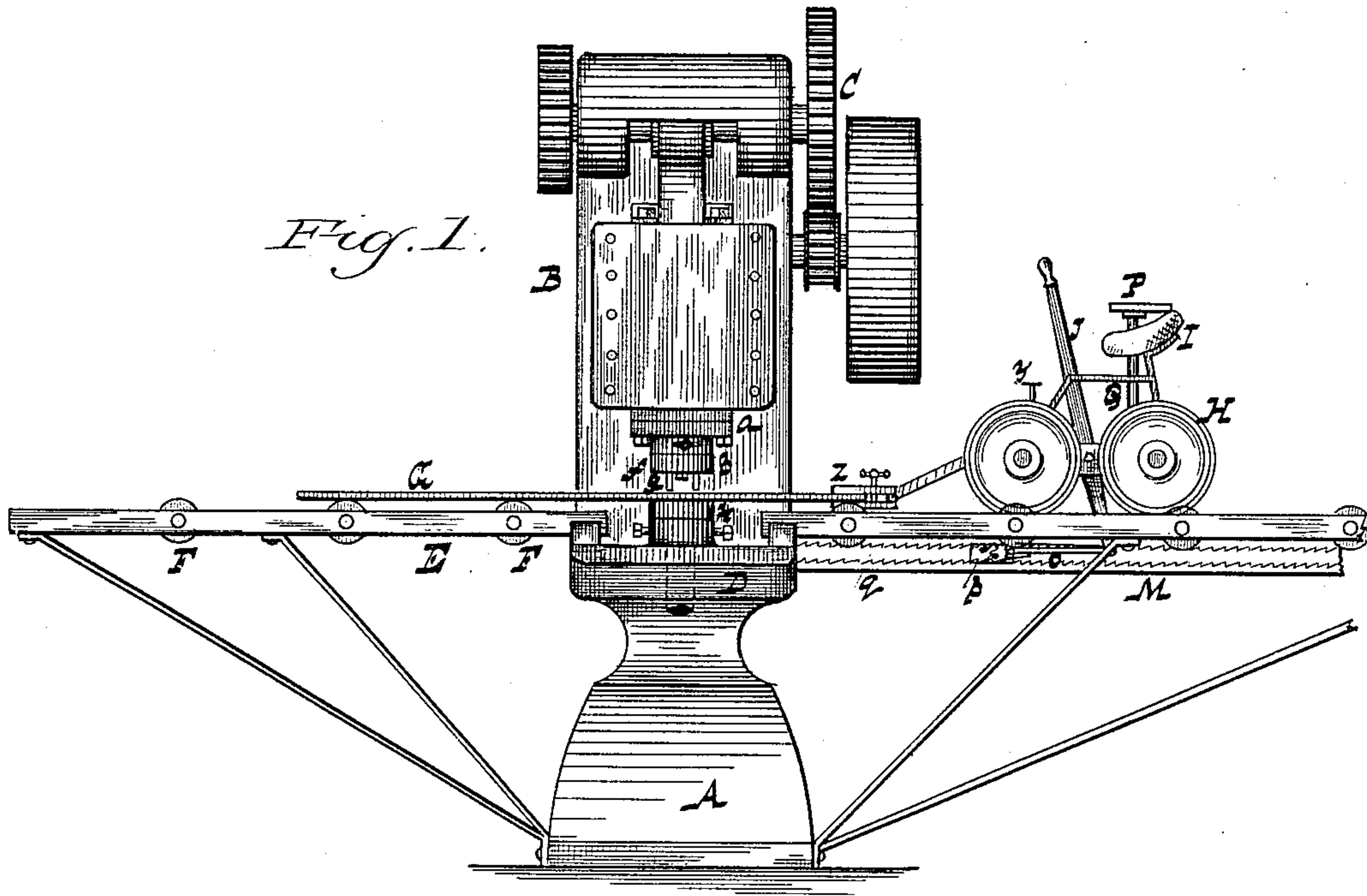
2 Sheets—Sheet 1.

C. M. CARNAHAN.

PUNCHING MACHINE.

No. 326,950.

Patented Sept. 29, 1885.



WITNESSES:
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W. S. Stack.

INVENTOR.
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att'y

(No Model.)

2 Sheets—Sheet 2.

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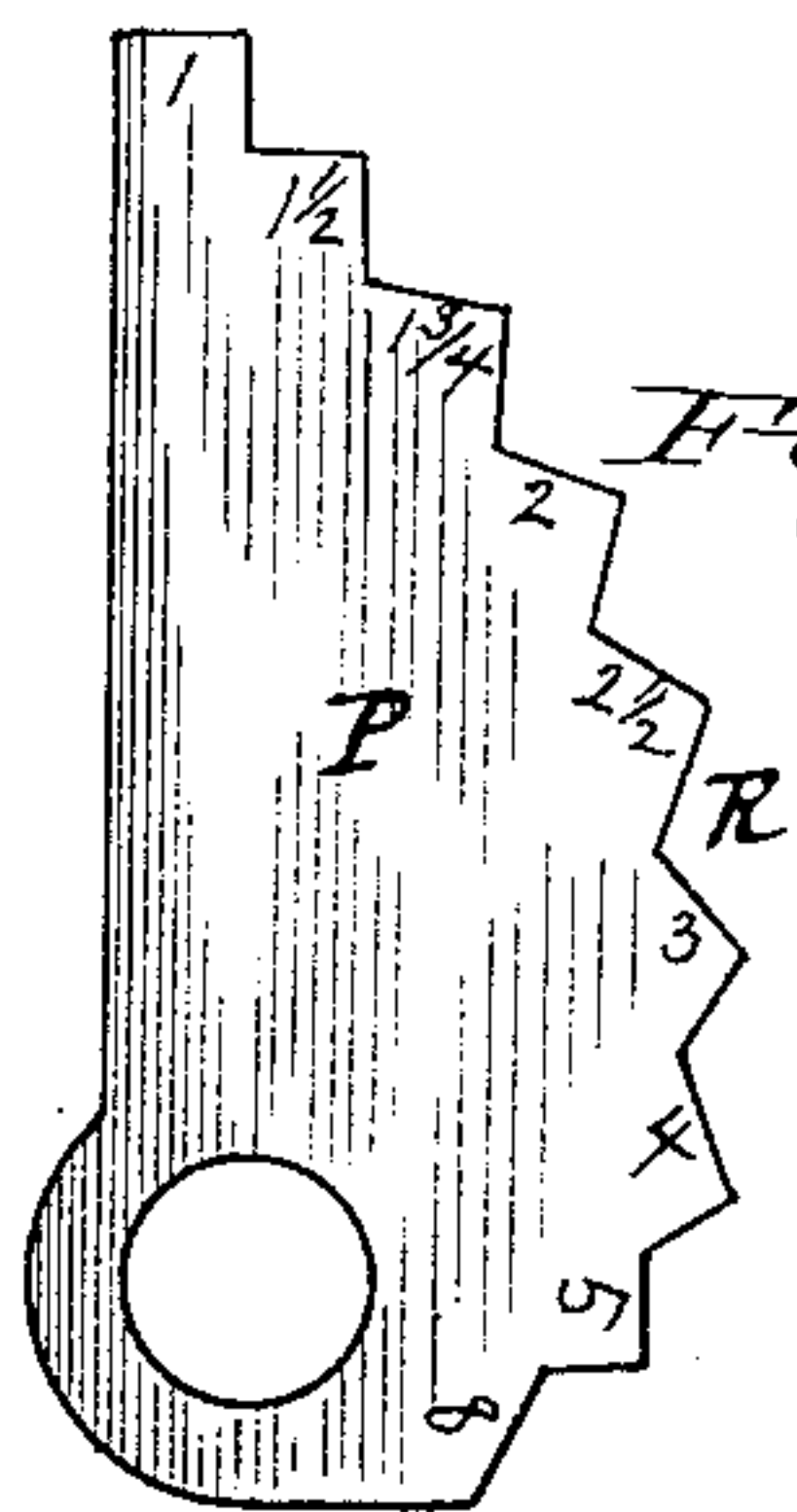


Fig. 6.

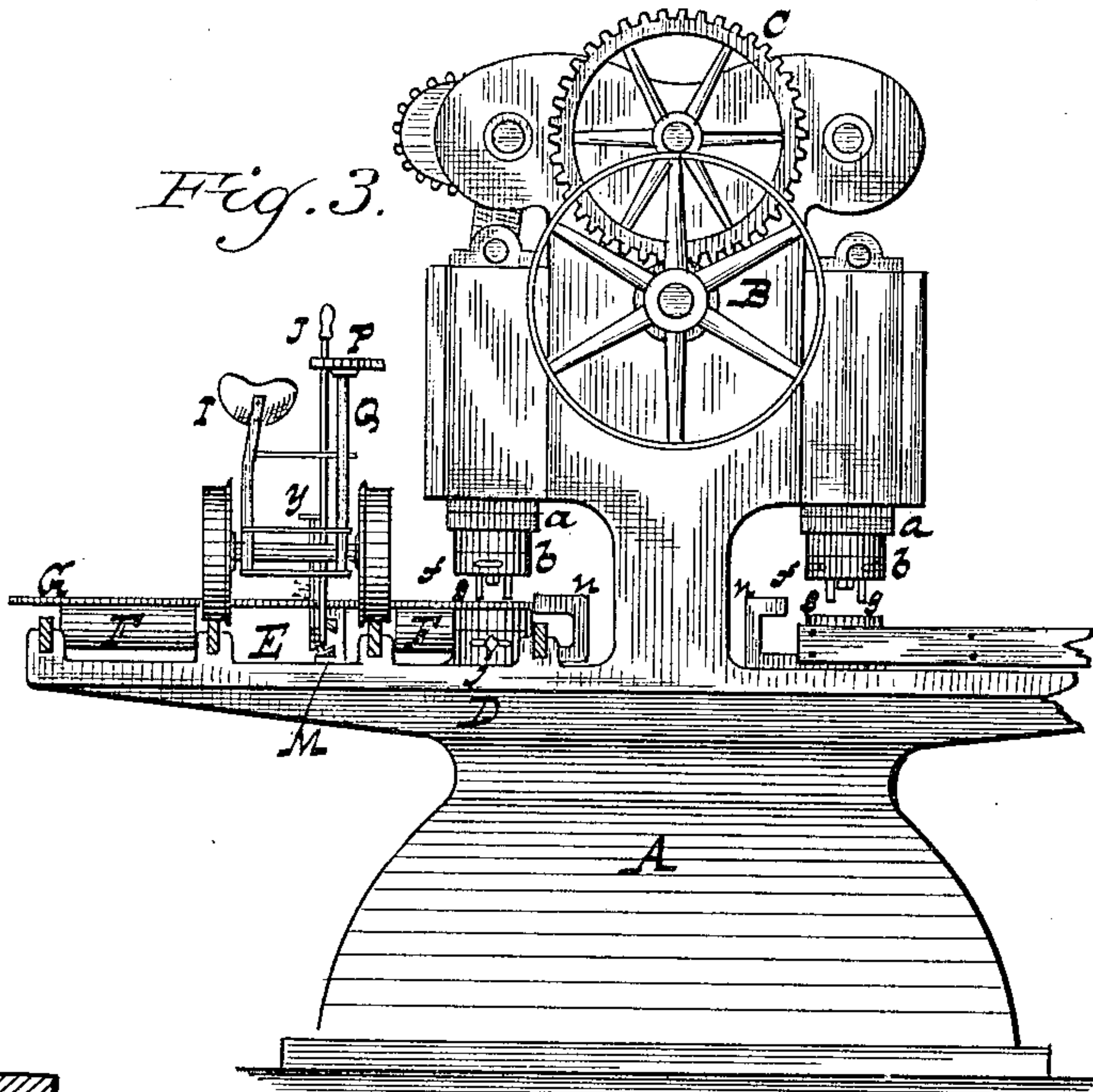


Fig. 3.

Fig. 7.

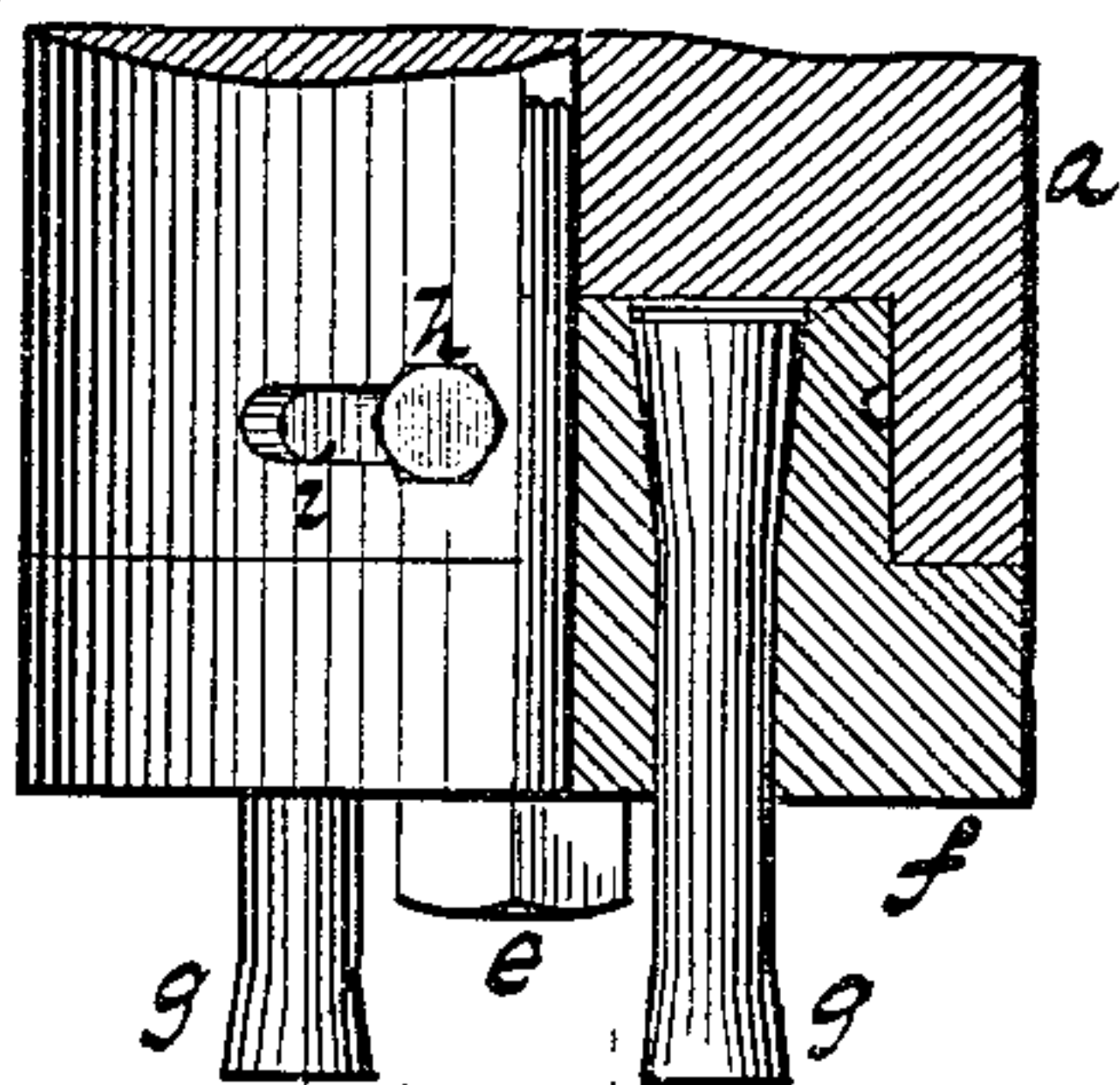


Fig. 4.

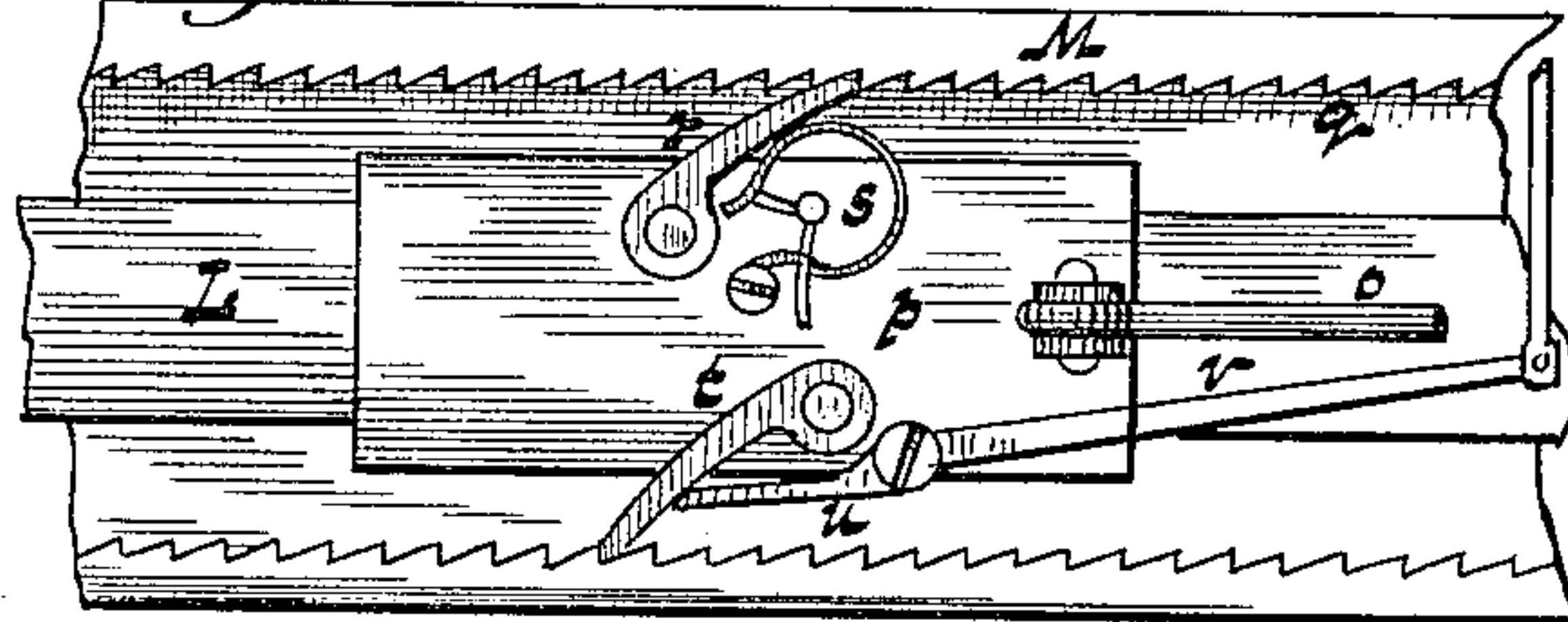


Fig. 8.

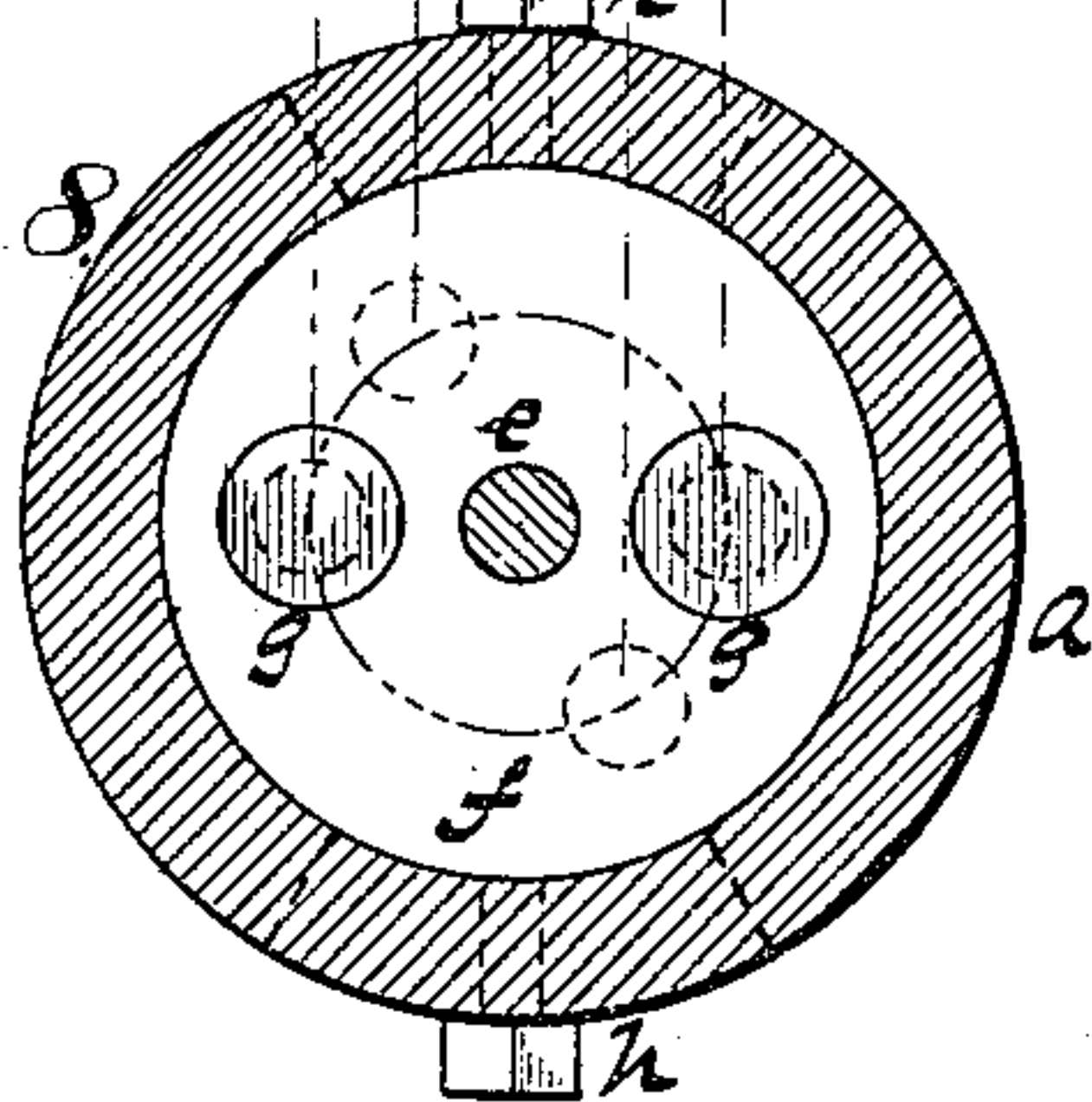
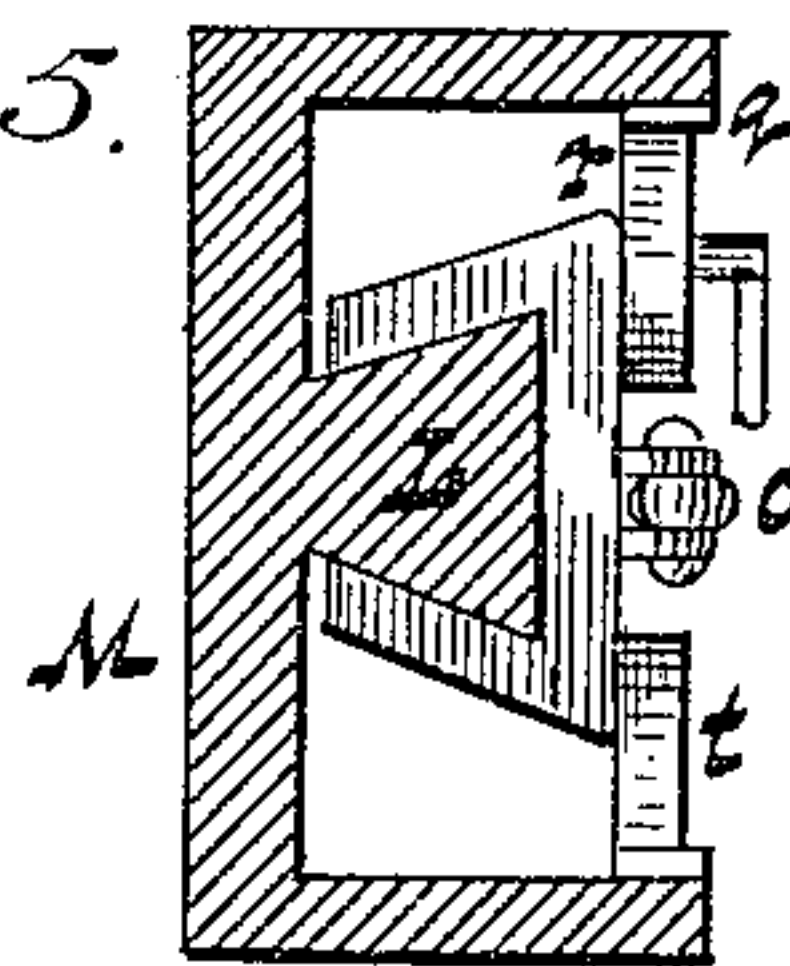


Fig. 5.



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UNITED STATES PATENT OFFICE.

CYRUS M. CARNAHAN, OF PITTSBURG, PENNSYLVANIA.

PUNCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 326,950, dated September 29, 1885.

Application filed February 24, 1885. (No model.)

To all whom it may concern:

Be it known that I, CYRUS M. CARNAHAN, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful improvement in that class of machines designed for punching rivet-holes in thick plates or sheets of metal, of which the following is a specification.

The improvement I have made consists in the adaptation of two separate punches and corresponding female dies within stocks that may be turned on their axis and so secured as that a single row of holes may be punched, two at a time, along or near the edge of a sheet of metal, or two parallel rows of holes may be punched at any distance from each other not exceeding the width between the punches, and so that the holes in the respective rows shall be opposite or occupy any intermediate position from a straight line to a right angle.

Another part of my invention relates to a device for producing an intermittent movement of the plates or sheets along under the punches by means of a system of levers and pawls operating conjointly with stationary ratchet bars or racks in such a manner as to enable the operator to change or vary the distance to suit any desired position of the holes.

Another part of my invention consists in a combination, with the punching-dies and the table or skeleton frame upon which the sheets of metal are placed while being operated on, of a series of anti-friction rollers, the axis of each being parallel, and all arranged obliquely across the table, whereby the sheet or heavy plate of metal, as it is moved along thereon, will tend toward and keep or present one edge in suitable position for the proper action of the punches.

The construction of parts comprising my invention will be readily understood from the following description, taken in connection with the accompanying drawings, wherein—

Figure 1 represents a front elevation of my improved punching-machine; Fig. 2, a top view or plan of the feed-table and means for moving and guiding a sheet of metal thereon; Fig. 3, an end elevation of the entire machine; Fig. 4, an enlarged and detached portion of the machine, containing and showing the pawls

and ratchets used in operating or moving the plate forward for the action of the punches; Fig. 5, a transverse section of the same; Fig. 6, an enlarged view of the curved and serrated gage-plate detached from the machine. Fig. 7 represents a die-box containing a stock or central part capable of being turned or rotated on a vertical axis, and provided with two punches, one on each side of said axis and parallel therewith; Fig. 8, a transverse section of the same on a horizontal plane.

In practice the base or stand A of the machine, together with its upper part, B, supporting a system of gears, C, and cams for giving proper movement to a vertically-reciprocating head, *a*, on one or both sides, may be substantially the same as those heretofore used in some punching and shearing machines, the construction of which being so well understood that no particular description thereof is herein deemed necessary; but for the purposes of my invention the vertically-moving head *a* has properly and rigidly attached to its lower end a strong circular die-box, *b*, containing a stock, *f*, capable of rotation therein around a central pivot or bolt, *e*, on the same axial line, which movable stock *f* is provided with two vertically-arranged punches, *g g*, each occupying a position opposite the other on a straight line drawn through the diameter of the stock, and an equal distance from its axis. This punch-stock *f*, as hereinbefore stated, is capable of being rotated on its axis within the die-box to the extent of bringing both punches parallel with the line of feed, or across the same, or at any angle thereto, and held in any of the aforesaid positions, or made adjustable with relation to the proposed work by means of one or more screw-bolts, *h*, that pass through circumferential slots *i* in the walls of the die-box *f* and connect the same with the punch-stock.

Firmly seated on the bench D of the machine, and rigidly affixed thereto beneath the aforesaid punches, is another box, *j*, containing a female die, *k*, or counterpart of the punches, and made adjustable in the same manner and by similar means as the punch-stock previously mentioned, so that the description of one will answer for both, the regulation or change of position in one to suit the other being very

easily effected without removing either from its respective supporting-box.

Attached to the front of the machine is a long table or skeleton frame, E, provided with a number of small rollers, F, all of which have their axes arranged in the same plane obliquely to and across the face of the table, whereby a heavy plate or thick sheet of metal, G, laid thereon and moved along will tend toward and keep its edge nearest the dies close against a stop or guard, n, that serves to prevent the plate from going too far in that direction, and enable the punches to form the holes m therein at any given or predetermined distance from its edge, either in a single row all in the same line, or in a double row the holes of which shall occupy alternate positions that are separated to the full extent of the punches, or closer together, if required—a matter wholly depending on the adjustment of the punches and the female counterpart.

Two horizontal and parallel bars, l, constituting the middle portion of the skeleton frame or table E, answer the purposes of a track, whereon is placed a small four-wheeled carriage, H, provided with a seat, I, for convenience of the operator. To the body of this carriage H is pivoted a long lever, J, its lower end being coupled, by means of a suitable link, o, with a slide, p, clamped to and having a rectilinear movement on a dovetailed projection, L, arranged lengthwise of and along the bottom of a narrow box, M, that is secured beneath the surface of the table E. Each inside edge of this box M is provided with a series of projecting angular teeth, q, constituting a straight rack, the teeth in the lower one being inclined upward toward the operator's seat, while those in the upper rack are inclined downward in a reverse direction.

Pivoted to the face of the slide p is a clutch or pawl, r, the free end of which is caused to engage with the teeth of the upper rack by means of a suitable spring, s, which contrivance allows the slide to move only in one direction, unless the spring is sufficiently compressed to disengage the said pawl entirely from its rack.

Near the lower edge of the slide p is another pawl, t, so pivoted thereto as to engage with the under rack by its own weight, and may be disengaged therefrom by means of the trip portion u of a long lever, v, also pivoted to the slide p, the opposite end of which is jointed to a vertical rod, w, that extends upward into the carriage H, and provided at its top with a small plate, y, upon which the operator may place his foot, depress the lever v, and thereby raise the pawl t to the extent of releasing the slide p, which may then, by means of the hand-lever J and its intermediate connections, be caused to move forward until the upper portion of said hand-lever comes in contact with a curved gage-plate, P, near to or beside the operator, on top of a short post, Q, to which it is pivoted, and made ad-

justable around its pivot in a horizontal plane. This gage-plate P is of peculiar shape, as shown in the drawings, Fig. 6, its longest edge forming a curve provided with a series of notches, R, that extend from near its pivotal point outward to its farthest extremity. By turning this ratchet-plate on its post until it occupies a place in the path of the hand-lever J it will act as a stop to its backward movement, the distance of its stroke in that direction being governed by that notch in the plate arranged to receive it, and these are graduated so as to increase or diminish that stroke by a mere turning of the plate.

The several parts of this machine having been constructed and combined as set forth, and a plate of iron, G, laid upon the inclined rollers F of the table and attached to the carriage H by means of a suitable clamp, Z, the operator mounts his seat I and presses down the foot-plate Y, which operation throws the under pawl, t, out of contact with its rack and thereby relieves the slide p. The operator then draws back the hand-lever J, and by this means causes the carriage and plate to advance toward the punches a distance required for their operation in the matter of punching holes along or near the edge of the plate, after the manner hereinbefore stated. By a succession of these several and conjoint movements of the mechanism a heavy plate of iron or steel may be pierced or provided with a single or double row of holes in a very easy and expeditious manner.

Having thus stated the nature of my invention, I claim—

1. In a machine for punching holes through metal plates, a vertically-moving head having attached thereto a die-box containing a punch-stock capable of rotation and adjustment on its axis, two punches affixed therein, each occupying a position opposite the other on a straight line drawn through the diameter of the stock, and an equal distance from its central point, a female die or counterpart of said punches affixed in a box and attached to the bench or bed-plate of the machine, so as to be adjustable with respect to the punches, and whereby a single or double row of holes may be punched through a plate of metal in the manner substantially as hereinbefore stated.

2. In a machine for punching holes through metal plates, the combination of the adjustable punch-stock, two punches therein, a female die or counterpart of said punches to operate conjointly therewith, a table or skeleton frame for supporting a plate of metal, a series of rollers therein arranged obliquely to and across the face of the table, a feeding mechanism consisting of a double ratchet with pawls operating therein, a system of levers and connecting-links for moving said pawls, and the carriage with its seat, hand, and foot mechanism, whereby the plate may be forced along in the manner and for the purposes hereinbefore stated.

3. In a machine of the character described, the combination of the mechanism for feeding a plate along, a carriage and hand-lever for operating said feed, a notched and adjustable gage-plate for determining the extent of such feed movement, and a track or means for supporting a carriage along and upon the feed-table or skeleton frame thereof, as shown and described.

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Witnesses:

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