M. A. LANAGAN.

AUTOMATIC PUNCH AND SHEARS.

No. 79,912. Patented July 14, 1868.

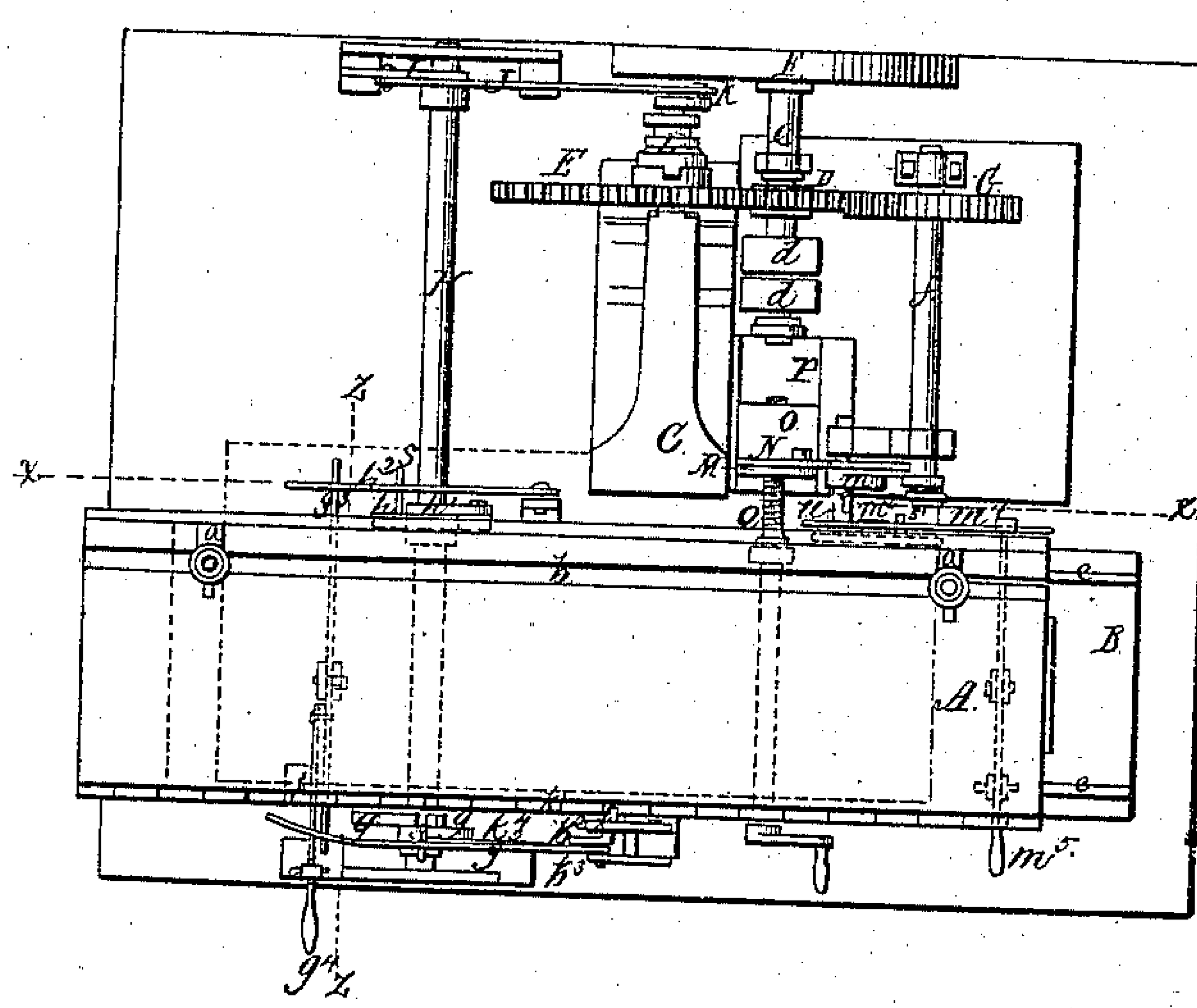
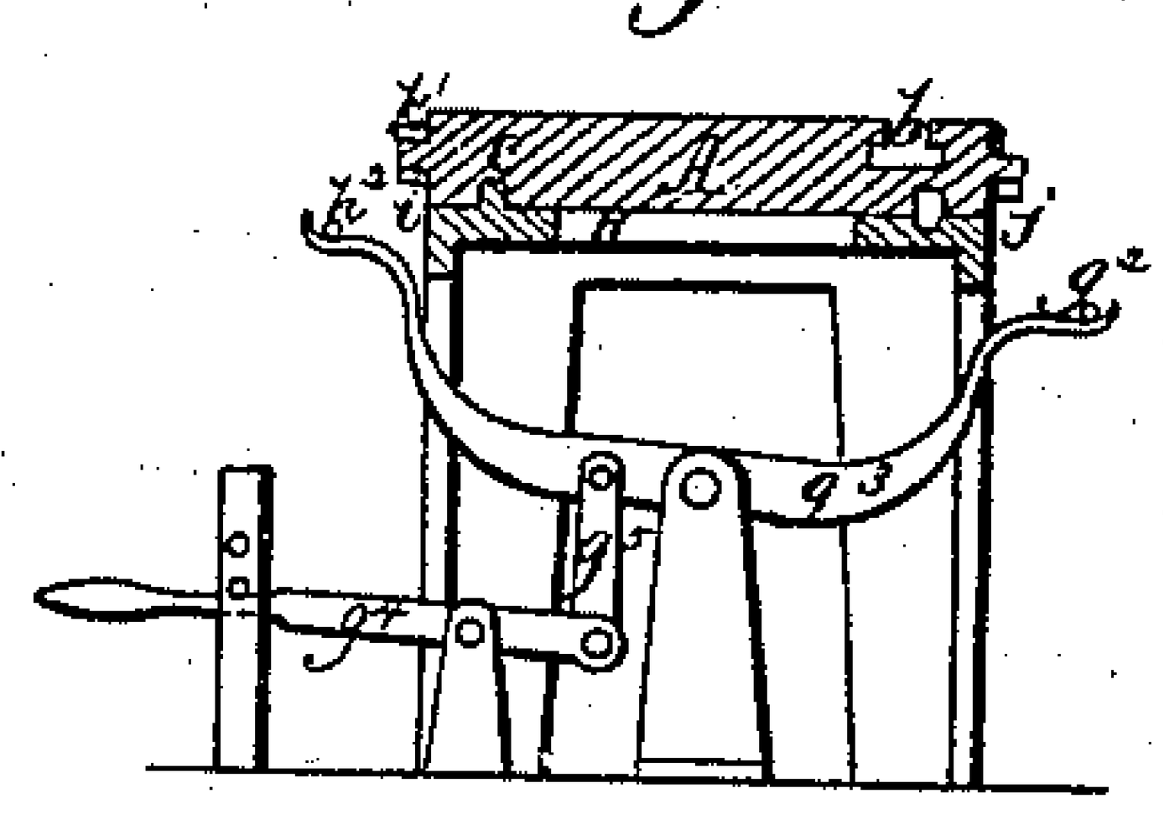


Fig: 1.

Fig: 4.



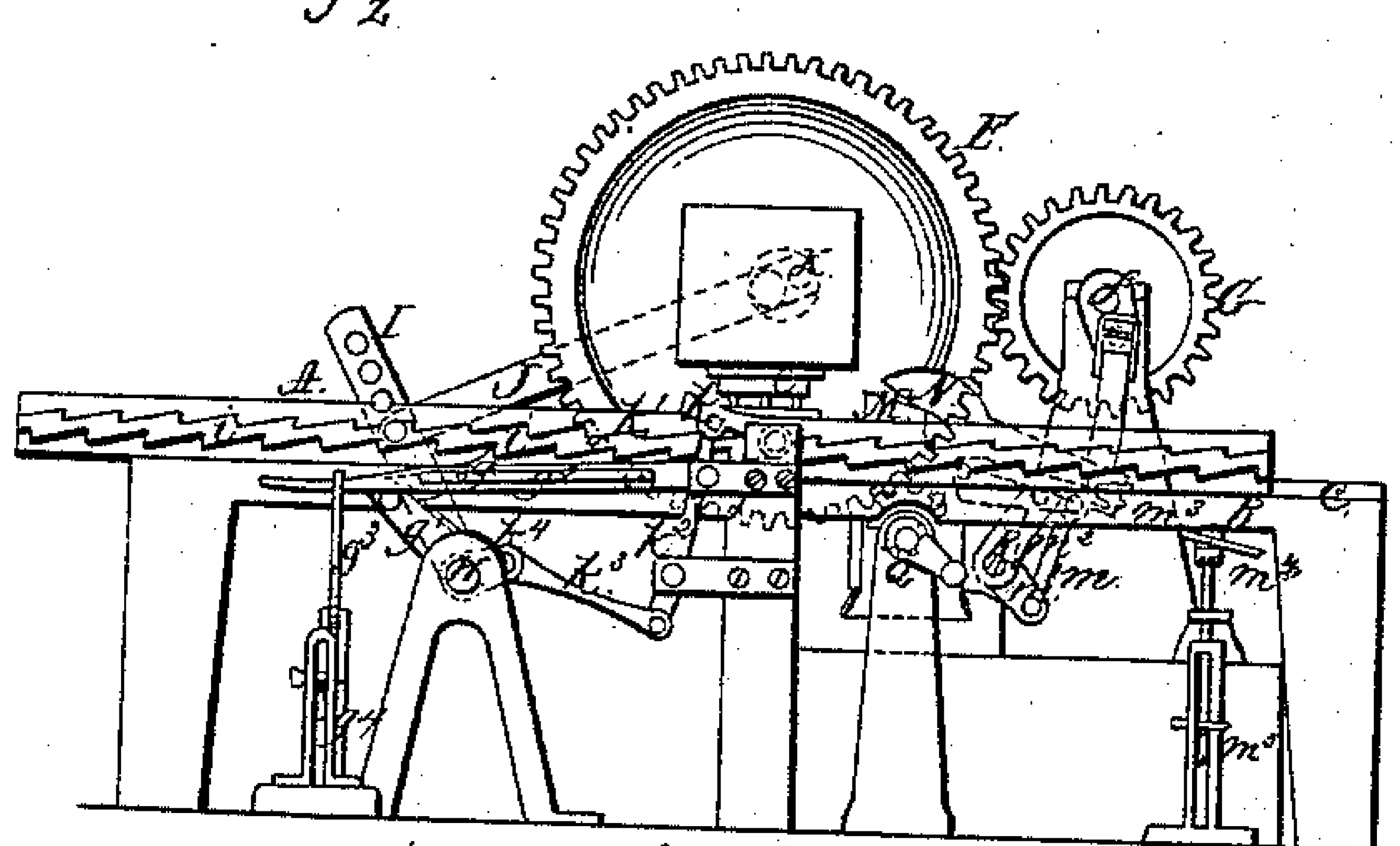


Fig: 2.

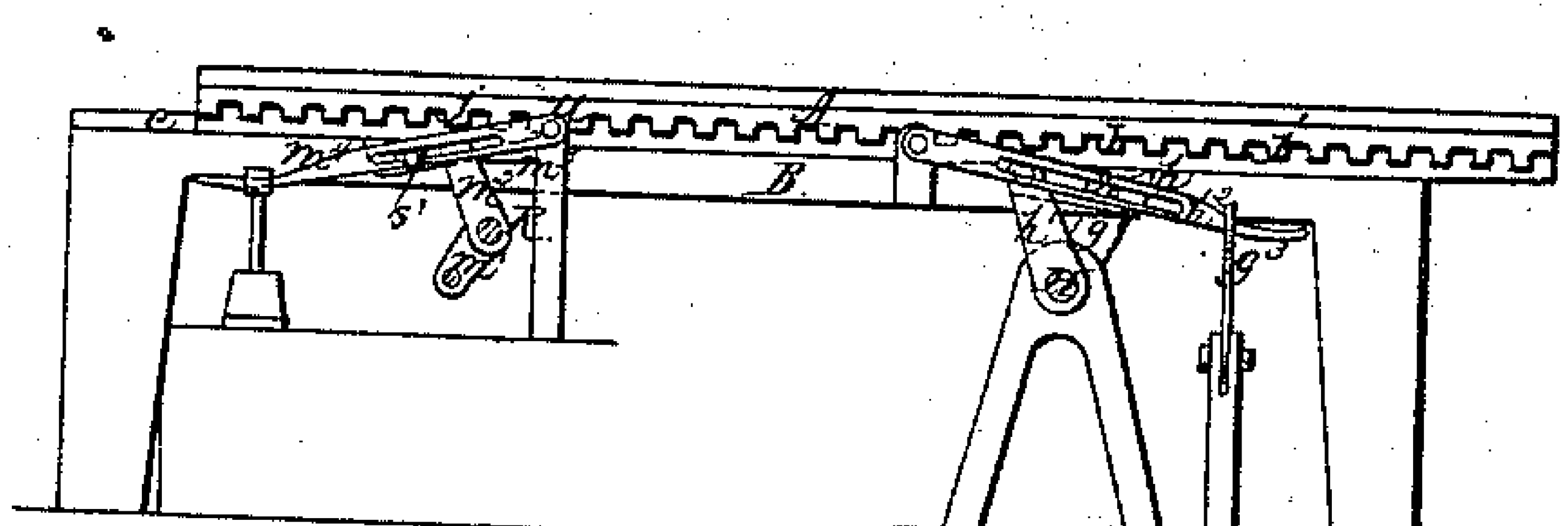


Fig: 3.

Witnesses:

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United States Patent Office.

MICHAEL A. LANAGAN, OF BROOKLYN, NEW YORK, ASSIGNOR TO HIMSELF, JOHN DAILEY, ROBERT RUSSELL, AND ANDREW MERCEIN.

Letters Patent No. 79,912, *dated July* 14, 1868.

IMPROVEMENT IN MACHINES FOR PUNCHING AND SHEARING.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that I, MICHAEL A. LANAGAN, of Brooklyn, in the county of Kings, and State of New York, have invented a new and useful Automatic Table-Punch and Shears, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, and in which—

Figure 1 represents a plan of an automatic table-punch and shears, constructed in accordance with my improvement.

Figure 2, a side elevation of the same.

Figure 3, a longitudinal sectional elevation, taken as indicated by the line *x x* in fig. 1, looking towards the table, and

Figure 4 a transverse section, taken as indicated by the line *z z* in fig. 1

Similar letters of reference indicate corresponding parts.

My invention consists in a novel combination of devices, for operation in the one machine, specially applicable to punching and shearing or trimming the edges of boiler-plates, and whereby the plate is automatically fed forward, in an intermittent manner, on or along with a suitable bed, to which it is clamped, and made to pass under an ordinary or other suitable punch, and subsequently, and as the plate moves forward, its edge trimmed by the action of a pair of shears working in connection with the punch; said combination of devices, including means for varying the length of the intermittent feed of the work, causing it to travel in opposite directions, as desired, or arresting its travel without stopping the punch or shears, and for feeding it in either direction by a motion derived from that of the shears, and irrespective of the general feed of it, in connection with the punch.

Referring to the accompanying drawing, A is a bed, to which the plate or work, represented by red lines in fig. 1, is or may be secured by clamps *a a*, adjustable along a groove, *b*, made in the top of the bed near its inner edge. This bed is arranged to travel, by a series of intermittent feeds, lengthwise of itself, in either direction, in or along rails *c c* of a table, B, said bed, or work thereon, crossing or working at right angles to a punch or punching-apparatus, C, which may be of the ordinary description used for punching boiler-plates, and which, where driven by power, may be worked with a belt, by fast and loose pulleys, *d d*, on a shaft, *e*, and pinion D on said shaft, working into a spur-wheel, E, hung on the operating-shaft of the punch. F is a fly-wheel, on the shaft *e*, connected with which may or may not be a handle for doing light work by hand. G is a spur-wheel, on a secondary shaft, *f*, for giving motion to the shears, as hereinafter described.

The feed of the bed A, with the work on it, in an intermittent manner, so as to bring the work under the punch, at regular or fixed distances apart, is or may be effected automatically, in either or opposite directions, by or through reversely-arranged pawls *g h*, driven by an oscillating-shaft, H, and biting (when in gear) into teeth *i j*, in the bed A, only one of such pawls being in gear at a time, according to the direction in which it is required to move the bed, or, when it is required to arrest the travel of the bed, throwing both pawls out of gear therewith, without stopping the motion of the punch or of the shaft H.

The means for doing this is or may be as follows: The shaft H is oscillated by or through a lever, I, fast thereto, and rod J, connected by an eccentric or crank-pin, K, on the punch-operating shaft, which latter may be provided with a sliding clutch, L, for throwing the punch in or out of working-action, as desired.

To vary the length of feed, as established by the pawls *g h*, according to the distance apart, it is required to punch the holes, or other circumstances.

The rod J is connected with the lever I by or through either one of a series of link-pin holes, or otherwise, so as to give more or less throw to the lever, and consequently increased or diminished feed to the pawl under action.

The pawls *g h* are connected to the shaft H by being pivoted to arms g^1 h^1, carried by the latter, and are thrown in or out of gear with their respective teeth *i* and *j* by or through levers, g^2 h^2, in slotted gear with the

pawls by pins *s s* projecting from the latter. These levers g^2 h^2 are or may be controlled by a cross rocking-beam, g^3, operated by a hand-lever, g^4, through pitman g^5, in such a manner as that, at a certain elevation of the hand-lever g^4, the rocking-beam g^3, on which the free ends of the levers g^2 h^2 rest, are made to adjust said levers g^2 h^2, so that both pawls, *g* and *h* are out of gear with their respective teeth, *i j*; but on elevating to a given further distance the hand-lever g^4, the pawl *h* will be put in gear with its rack or teeth *j*, or, on depressing said hand-lever to a given distance below its first-mentioned position, the pawl *g* will be thrown into gear with its rack or teeth *i*, the reversely-acting pawl *h* falling by the dropping of its lever h^2 out of gear with the bed. In this way may the bed A be stopped or started, and run in either direction by a simple adjustment of the hand-lever g^4, without changing or interfering with the motion of the shaft H.

To keep the bed A steady in its forward feed, which is when operated by the pawl *g*, a check-pawl or dog, *k*, is made to drop into gear with the bed by a rack or teeth, k^1, at the close of each intermittent feed, said check-dog being lifted out of gear, before the next feed, by a lever, k^2, pitman k^3, and crank k^4, driven by the oscillating-shaft H.

The boiler-plate thus punched, at uniform distances, which may be regulated as described, has its punched edge trimmed in a regular and automatic manner, as it passes along with the bed, by means of shears arranged on one side of the punch, and whereby after-clipping or dressing of the plate by hand is avoided. These shears, of which M is the stationary cutter, and N the working one or jaw, are carried by a sliding block, O, adjustable along a bed, P, by a screw, Q, operated by a hand-crank or handle, for the purpose of regulating the action of the shears relatively to the edge of the plate. The working-jaw N is driven by a crank, *l*, and pitman *l'*, from or by the shaft *f*.

To invest such machine with additional facilities, or make it more generally useful, the shears, though thus operating in connection with the punch, it is desirable should at times admit of being worked independently of the latter, or of the feed of the bed A by the pawls *g* or *h*, and their pertaining mechanism, but at the same time effect the feed of the bed in either or opposite directions by devices connected in a direct manner, as it were, or as driven by the shears, also of stopping the feed of the bed without arresting the motion of the shears. To this end, supposing the punch to be stopped, or general feed of the bed by the pawls *g* and *h* to be arrested, I provide for the movement of said bed in either direction, as required, or stop it at pleasure, according to the work required to be done by the shears, as follows: Jointed to the working-jaw N of the shears, at or near its outer end, is a pitman, *m*, that serves, through a crank, m^1, to vibrate a shaft, R. This shaft carries an arm, m^2, which has pivoted to or across its outer end a double pawl or bar, m^3, constructed to bite or gear at either of its ends, or on opposite sides of the shaft R, into the rack or teeth *j* of the bed A.

In gear with this double pawl m^3, by a pin, s', is a slotted lever, m^4, working on a fulcrum, as at *u*, and connected at its free end with a hand-lever, m^5, that, accordingly as it is raised or lowered and adjusted, serves to throw either end of the double pawl m^3 into or out of gear with the teeth or rack *j* of the bed A, and so, without stopping or changing the motion of the shaft R, feeding the bed A in an automatic and regular manner forwards or backwards, as desired, by a motion derived directly from the shears, or arresting the movement of the bed without stopping the shears, as the case may be, or exigencies of the work require.

What is here claimed, and desired to be secured by Letters Patent, is—

1. In combination with the punch C, the plate-carrying bed A, arranged to slide crosswise of the punch, and provided with racks or teeth *i j* on opposite edges of it, reverse-pawls *g h*, connected by arms g^1 h^1 with a vibrating-shaft H, slotted levers g^2 h^2, in connection with said pawls, and beam-lever g^3 for throwing either pawl in gear with the bed, or disconnecting both therefrom, to reverse or stop the motion of the bed without changing or arresting the movement of the punch, essentially as specified.

2. The combination, with the punch C, of the intermittently-fed bed A and shears M N, arranged, as described, for operation together automatically to punch the plate in a regular or uniform manner, and to trim or dress its edge as it is passed through the machine, substantially as herein set forth.

3. The combination, with the shears M N and intermittently-fed bed A, of the double pawl m^3 and accompanying mechanism for giving a reverse action to the bed, or arresting its motion without changing or stopping the shears, essentially as specified.

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Witnesses:
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