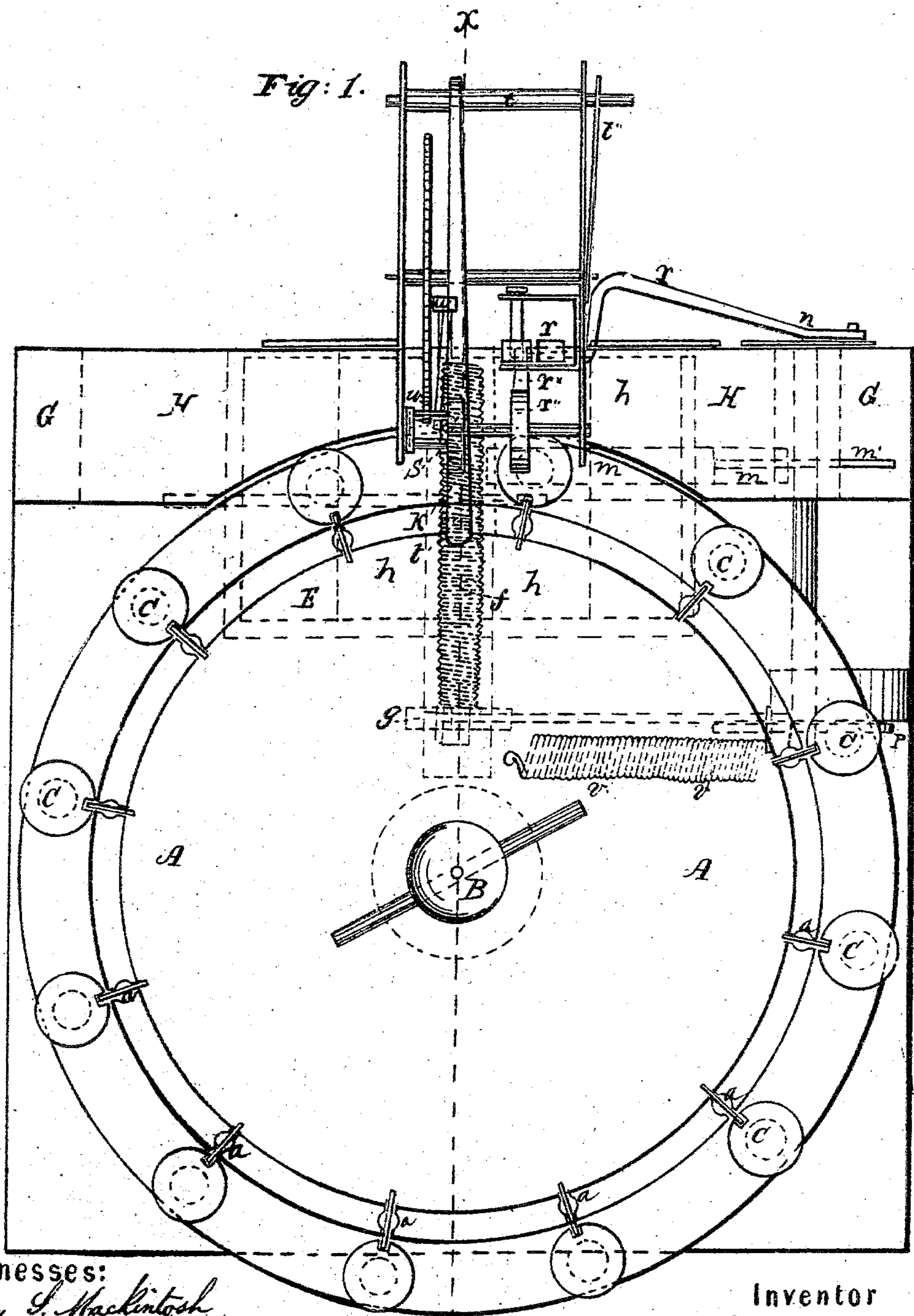


No. 87,941.

PATENTED MAR. 16, 1869.

C. F. JOHNSON, JR.
MECHANICAL TYPOGRAPHER.

3 SHEETS—SHEET 1.



Witnesses:
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Inventor
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3 SHEETS—SHEET 2.

Fig: 2.

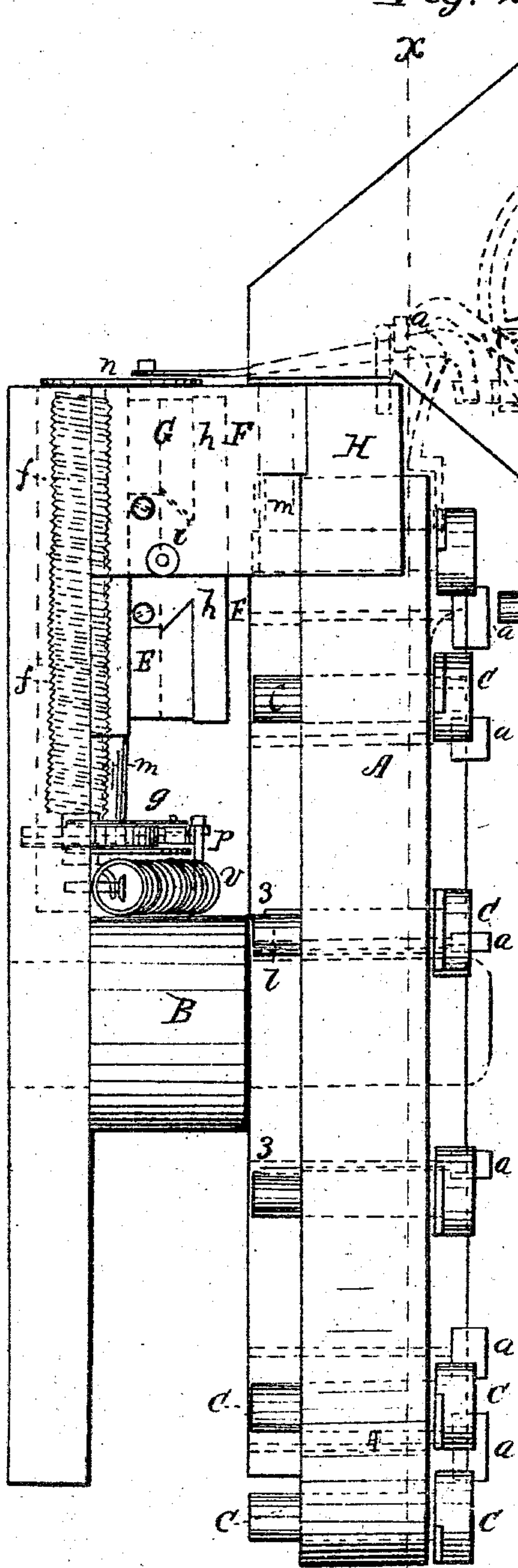
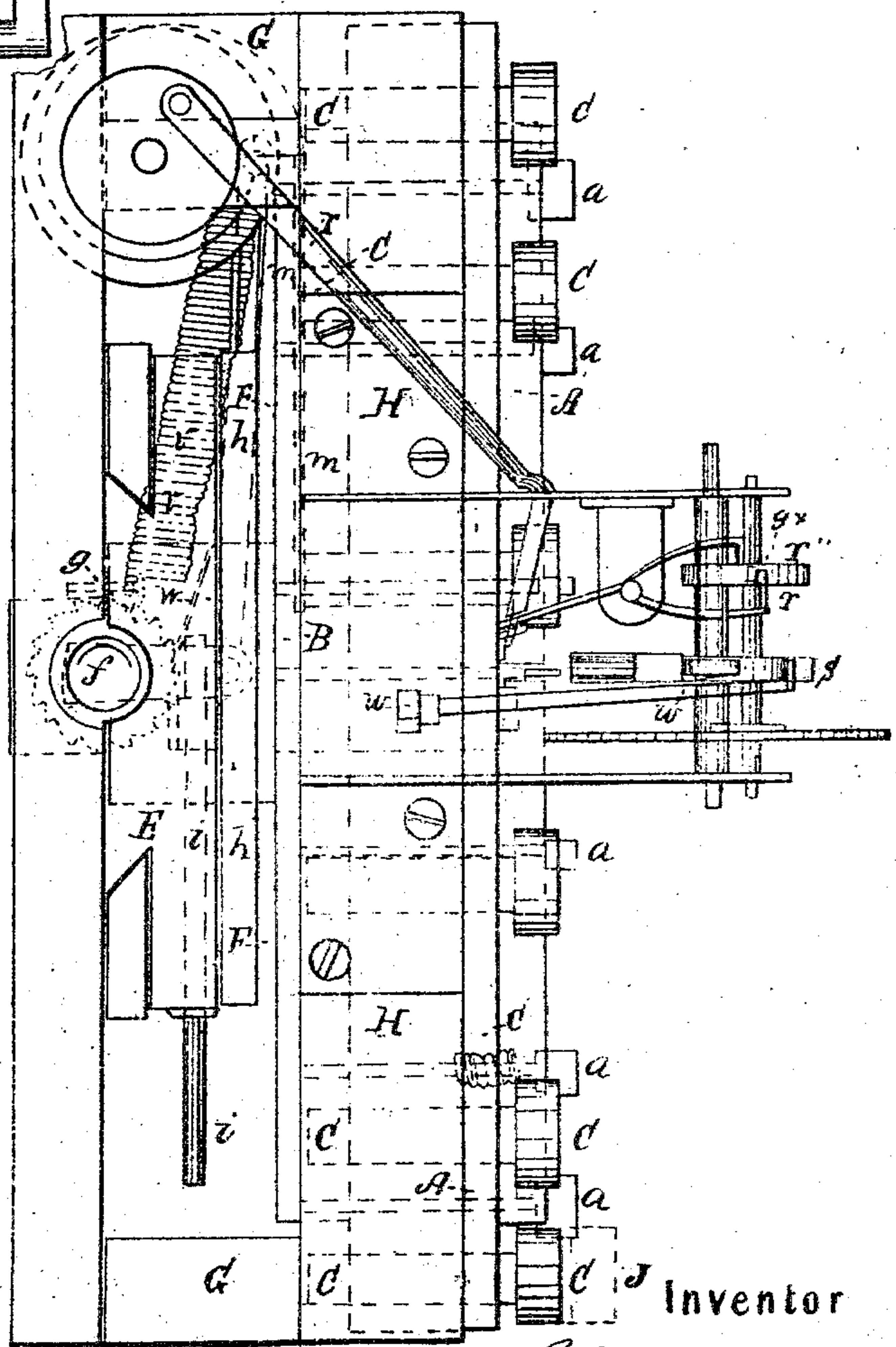


Fig: 3.



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3 SHEETS—SHEET 3.

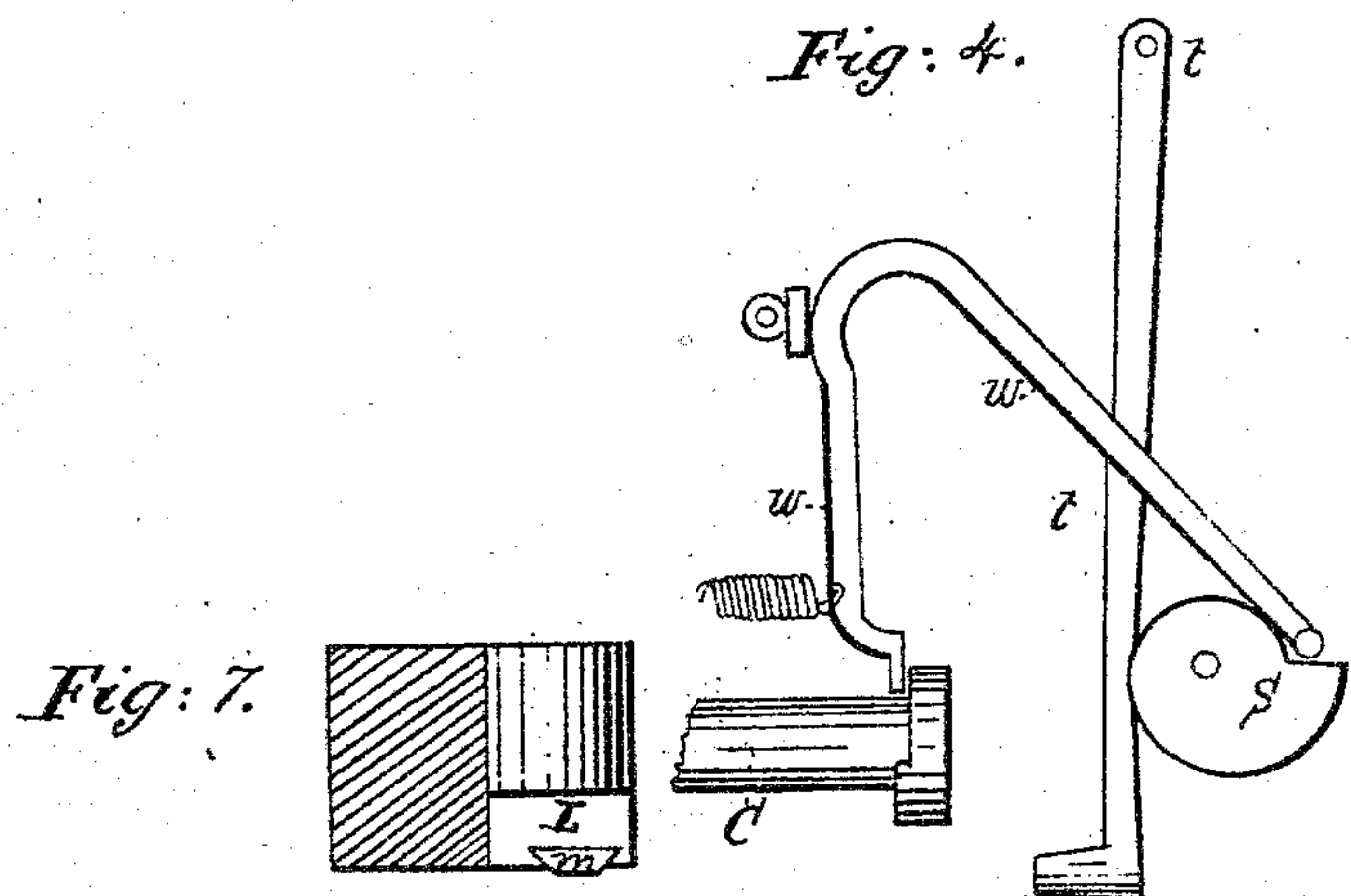


Fig: 5.

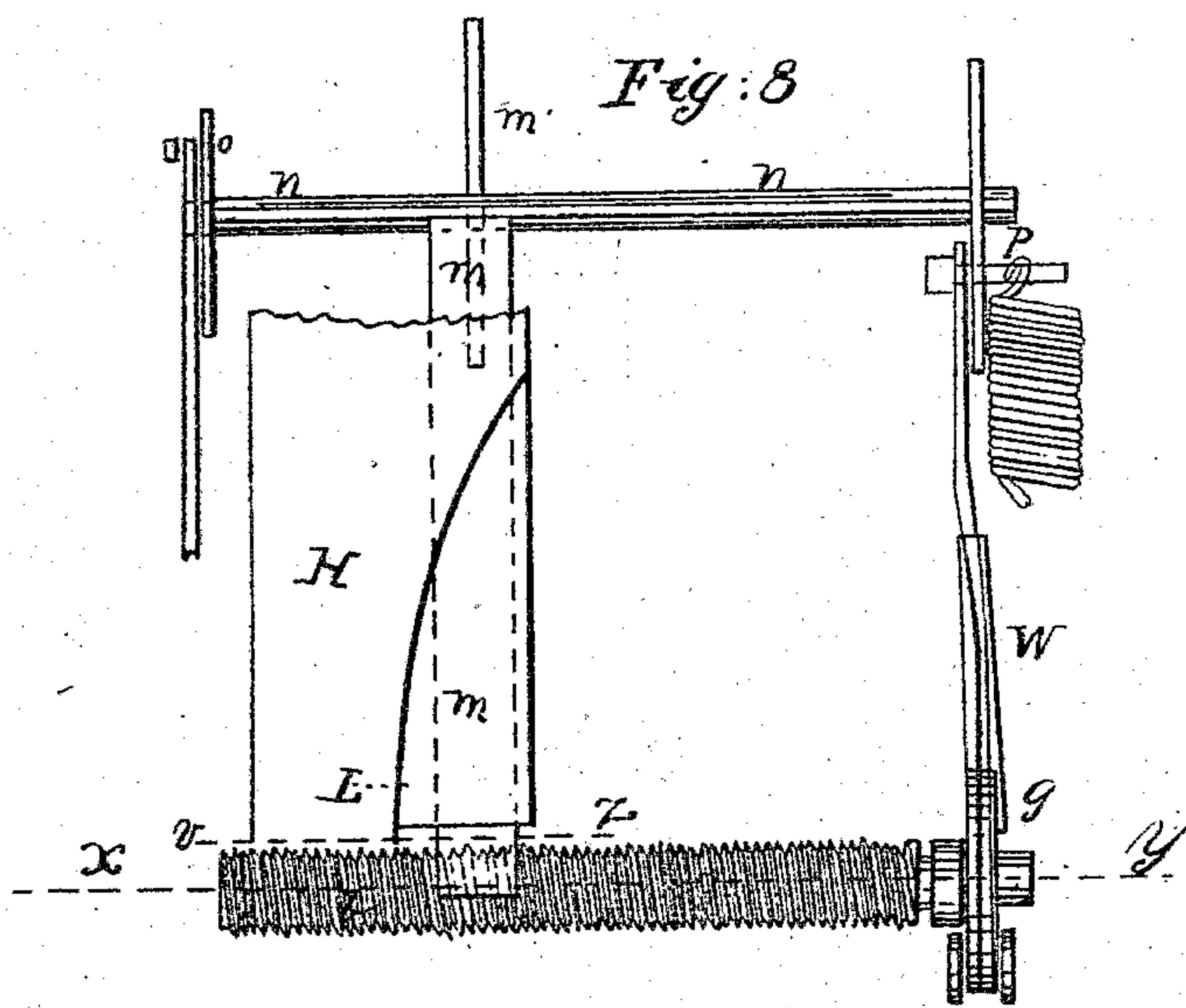
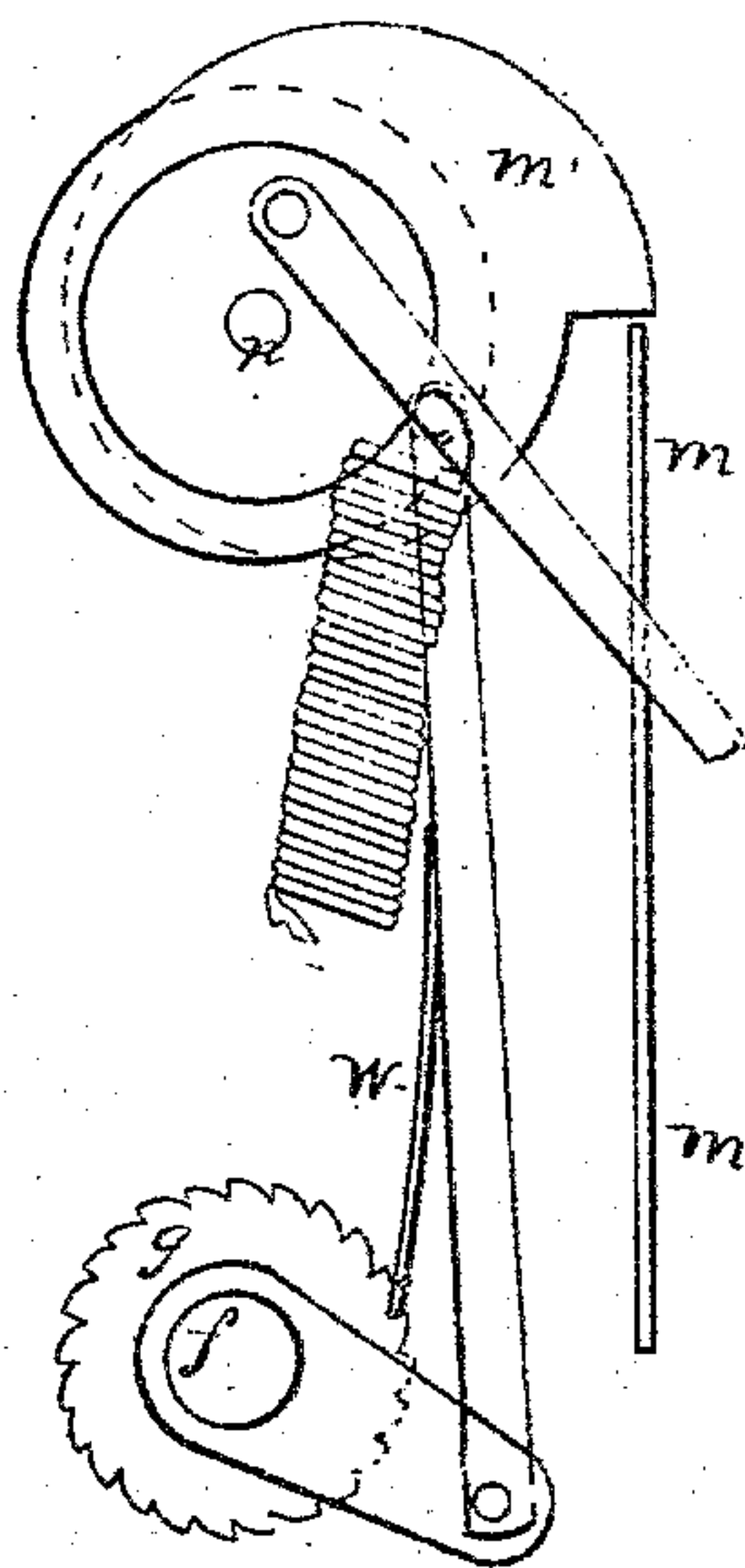
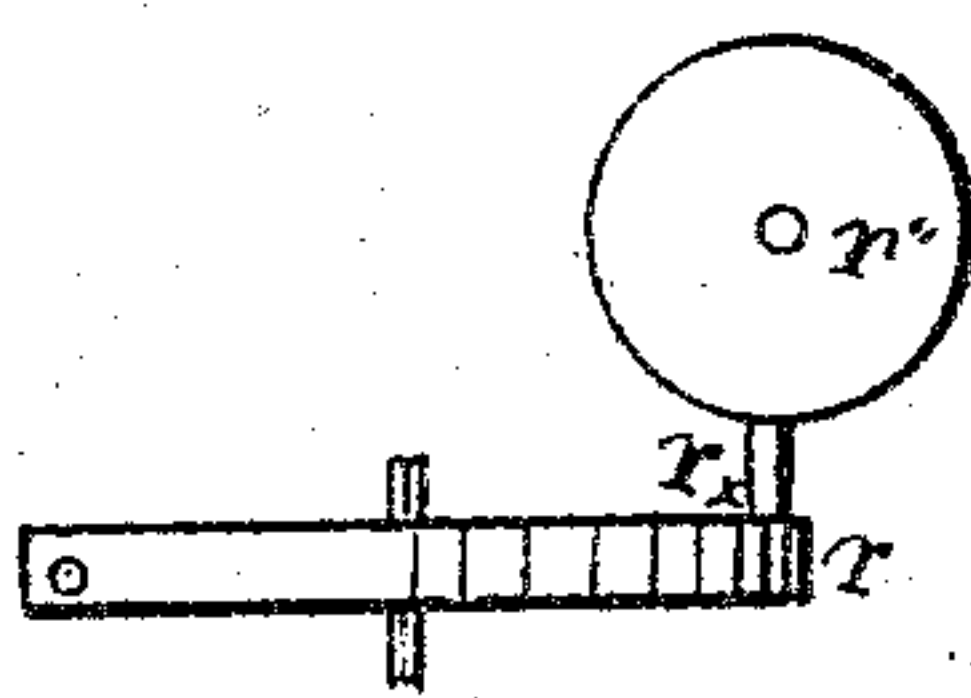
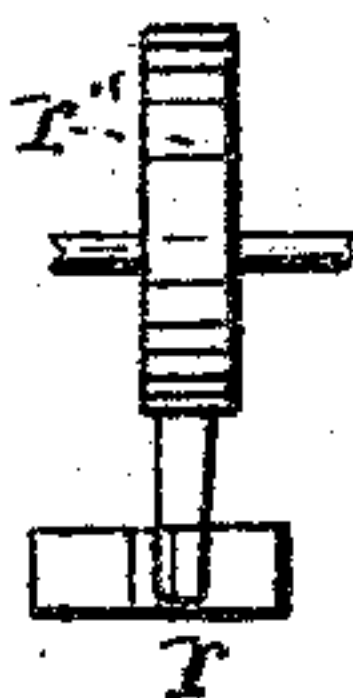


Fig: 6.

Fig: 9.

Fig: 10.



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UNITED STATES PATENT OFFICE.

CHARLES F. JOHNSON, JR., OF OWEGO, NEW YORK.

IMPROVEMENT IN MECHANICAL TYPOGRAPHERS.

Specification forming part of Letters Patent No. 87,941, dated March 16, 1869.

To all whom it may concern:

Be it known that I, CHARLES F. JOHNSON, Jr., of the village of Owego, in the county of Tioga and State of New York, have invented a new and useful machine for the purpose of forming stereotype-plates, or the matrices or molds from which stereotype-plates may be electrotyped or cast, without the use of the movable types at present used in printing. I denominate my machine "The Stereotype-Machine;" and I do hereby declare that the following is a full, clear, and exact description of the operation and construction of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a plan from above; Fig. 2, a side view from the left of Fig. 1; Fig. 3, a side view from the upper side of Fig. 1; and the several figures on Sheet 3, separate views of detached parts, to be more fully referred to and explained hereafter.

In Figs. 1, 2, and 3, A A is a horizontal wheel, which I denominate the "type-wheel," capable of turning on the central pin or axis B. This wheel may be turned by hand, or a slow rotation—about twenty revolutions per minute—may be imparted to it through the intervention of a train run by a weight, the fly gearing into teeth on its outer periphery. This wheel is horizontal, and near its edge are inserted the cylindrical vertical pins C C in holes made for their reception. They are capable of end motion, and in the drawings are represented in their lowest position. They are intended to work with friction sufficient to retain them in position, so that they will not fall with their own weight. Should it be found necessary, a spring can be inserted by the side of each, to prevent them from dropping. I will denominate them "keys." A notch is turned in the lower corner of the wheel.

When the keys are in their lowest position their ends project into this space, as shown at Fig. 2. When they are in their highest position their ends are flush with the bottom of the hole, the head of the key taking the position represented by the dotted lines at J, Fig. 3. Corresponding to each of these keys is a punch, *a a a*, Figs. 1, 2, and 3. These punches also work vertically in holes in the wheel.

They are held in their position by spiral springs around them. One of these spiral springs is indicated by the dotted red lines at *b b*, Fig. 3. The part of the punches below the head is also dotted in red ink, Figs. 2 and 3, in order to distinguish it.

The head of the punch is made flat, and works in a gain in the raised part of the wheel, as shown in Fig. 1. The lower part is round. The wide head will prevent turning.

The upper part of the hole is made large enough to receive the spiral spring *s*, the bottom of the springs resting on the shoulder thus formed, and the wide head of the punch resting on the top of the spring. The bottom of the hole fits the shank of the punch closely.

It is evident that the punches can be depressed slightly if force is applied to them, and will be raised to their former position when the force which depressed them is withdrawn.

The face of the punch which is to form a letter is flush with or projects a little below the lower face of the type-wheel.

The punches are to be similar to the punches used in forming the bottom of the mold from which type are cast.

The pin B, on which the type-wheel turns, is fastened into the bed plate or frame of the machine. On this bed-plate is a sliding bed, E E, working in horizontal guides in the direction of the line *x y*. This bed is worked through the medium of the screw *f f*, working in a nut in the lower part of the bed.

The screw is turned by means of the ratchet *g*, in a manner to be more particularly described hereafter. This lower bed carries an upper one, *h*, sliding in guides on the top of the lower one, and capable of a motion at right angles to the motion of the lower one. It is to be moved by the screw *i i*, which is to be turned by hand. On this is to be temporarily fastened a plate of lead or other malleable material, for the purpose of receiving the successive impressions of the type-punches. The lower bed, carrying on it the upper one, is to be moved the distance requisite for each successive letter; the upper one the distance requisite for each successive line.

The lead plate will be clamped in a horizontal position onto the upper bed at F.

I will now explain how the letter which is

to be impressed is arrested in its proper position and forced downward into the plate which is to receive the impression. Attached to the frame are two upright pieces, G G, which firmly support a cross-piece, H H, Figs. 1, 2, and 3. This is high enough to allow the sliding beds and the plate on them to pass under it, and is cut out, as shown, to receive the wheel. When the keys are in their highest position there is no obstacle offered to the free rotation of the type-wheel. When, however, any key is pushed down, the wheel moves till this key reaches the point K, Fig. 1. The bottom of the key then strikes the projection on the lower part of the cross-piece, and the wheel is stopped. This projection is shown in the view and section in Figs. 7 and 8.

Fig. 8 represents the screw and feed motion, with the beds and type-wheel detached, and a portion of the cross-piece. Fig. 7 is a section, vertical, on the line Z V.

The projection is shown at L, and is on the lower part of the cross-piece, and fills the notch in the lower part of the wheel. When the wheel is brought to rest, by reason of the end of the key having been pushed down far enough to strike it, the punch corresponding to this key is over the lead plate, in the proper position, relative to it, to be impressed into the plate. The centre of the punch is on the line X Y.

I will now explain how this punch is forced down, the key raised to its original position, allowing the wheel to move on, and the bed beneath moved, so as to be in position to receive the next letter, or, rather, punch. On the under side of the projection is a slide, *m*, Figs. 7, 5, and 8, working endwise in a groove, and its end extending beyond the edge of the projection. The position of this slide is represented in Figs. 1, 2, and 3 by the dotted red lines at M M. The end of the pin or key which has been pushed down strikes in its revolution the end of this slide and forces it back till the key is brought to rest by bringing up against the projection referred to. The other end of this slide bears against a notch in the cam-shaped wheel *m'* on the rock-shaft *n*. A slight rotary motion will thus be imparted to the rock-shaft. On this rock-shaft are two other wheels, or arms, one at *o*, the other at *p*. The arm at *o* works the escapement *r*, Figs. 1, 2, and 3, by means of a connecting-rod, *r'*. The arm at *p* works the pawl of the ratchet *g*. The escapement-wheel is to be driven, by a suitable weight and train, in the direction of the arrow. The escapement-wheel *r''* has but one tooth, *r^x*, which is released from the upper jaw of the escapement by the motion now considered, and flies round till it is caught by the lower jaw, thus making nearly an entire revolution.

Figs. 6, 9, and 10 show three views of the escapement, from which its action can be readily understood.

On the shaft of the escapement-wheel is a cam, S, Figs. 1, 2, 3, 4. In its revolution the

cam will depress the lever *t*, turning on the center *t'*, and held up by the spring *t''*. The bent head of this lever, coming on the head of the type in position, will push it down, and impress the face of the punch in the lead plate underneath. The first half of the revolution of the cam will impress the letter; the last half will raise the key which held the wheel still. This is effected by means of the bent lever *u*, Fig. 4, the toe of which projects over the wheel and under a key, into a notch in the head of the key. This bent lever is also represented in position on Figs. 1, 2, and 3. The key being thus raised above the projection, the wheel is free to move on.

The spiral spring *v*, attached to the frame and to the wheel *p*, now brings the rock-shaft to its original position. The slide *m* is pushed out to its former position. The escapement is worked so that the tooth passes the lower jaw and is held by the upper; and the pawl *w*, which had been carried over one or more teeth of the ratchet, will, in its reverse motion, rotate the screw *f* a corresponding amount. This will, of course, work the bed out, and carry the plate to the position proper for the next letter. The bottoms of the letters will be parallel to the line *x y*.

The length of all the punches must be the same, that all impressions may be of equal depth. It is evident that the plate must be moved more or less, according as a narrow or a wide letter has been impressed. The letter "m" requires more room than the letter "i." This is effected by cutting away the bottom of the keys at the part where they strike the slide.

The pins so cut away (shown at 3 3, Fig. 2) will push the slide back a less distance before they bring up against the projection or shoulder. Such pins will, consequently, impart a less motion to the rock-shaft, and the click or pawl will pass over fewer teeth, and, in its reverse motion, turn the feed-screw *f* through less of a revolution. The amount cut away will thus regulate the motion of the plate.

To move the plate without making any impression, so as to leave a space between two words, it will only be necessary to have one of the keys without any type-punch corresponding. When this is pushed down and comes into position all the operations, except impressing the letter, will be performed.

On a working machine it would be necessary to have, at least, enough keys for one full alphabet of small letters and capitals, beside numerals and marks of punctuation. The character corresponding to a key should, of course, be plainly represented on the top of the key.

In operating this machine, the operator sits or stands on the lower side toward Y, Fig. 1, and pushes down, in succession, from left to right, the keys corresponding to the letters of the word he wishes to impress, turning the wheel at the same time from right to left. The keys he has pushed down come, in succession, under the lever, and the punches correspond-

ing are impressed in their proper order. When he comes to the end of a word he pushes down the key corresponding to a blank space. When this comes into position the cam makes a revolution; but no impression is made. The plate is moved, however, and the next letter that is impressed is at a distance from the last corresponding to the distance or space between two words. When he comes to the end of a line the click or pawl must be raised and the screw *f* turned back by hand. Then the other screw, *i*, must be turned, so as to present a fresh surface of the plate on which to impress the next line.

If ordinary or relief punches are used a matrix-plate will be formed, from which an electrotypes-plate may be taken, as well as from the plaster mold now used for that purpose.

I do not wish to confine myself to the use of a lead matrix, for prepared papier-maché or copper might be substituted; and from such a matrix a stereotype-plate might be cast in type-metal. If hollow or intaglio punches are substituted, a relief-plate might be formed in type-metal or lead, from which the necessary impressions on paper could be directly struck.

As to material, the frame, sliding beds, and type-wheel should be made of cast-iron; the punches, cam-shafts, and levers, of steel; and the gear-wheels of composition or cast-iron.

Claims.

I claim as novel, and desire to secure by Letters Patent, the following points:

1. I claim the movable type-punches *a a*, in combination with the keys *C*, substantially as shown, for the purpose set forth.

2. I claim the combination of the slide *m*, the rock-shaft *n*, the ratchet *g*, and the keys *C*, constituting the feed-motion of the machine, substantially as set forth.

3. I claim producing the variable feed of the upper bed-plate, adapted to successive letters of different widths by modifications of the keys *C*, substantially as shown.

4. I claim, in combination with each other, the escapement and cam movements, substantially as and for the purpose set forth.

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Witnesses:

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CHARLES J. WHITE.