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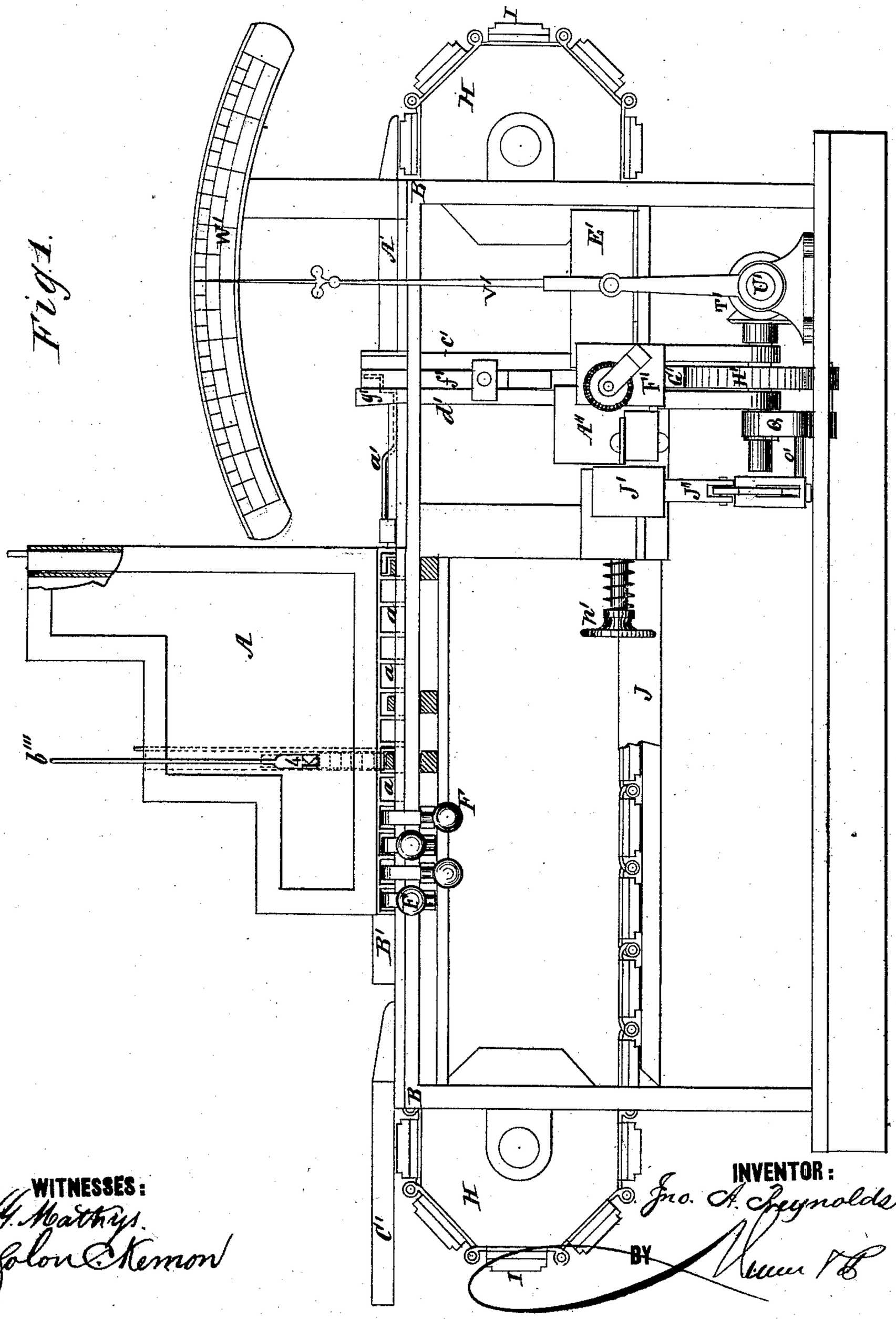
J. A. REYNOLDS.

Type Setting-Machines.

No. 152,868. Patented July 7, 1874.

Fig. 1.



WITNESSES:

G. Matthys.

Solon C. Kemon

INVENTOR:

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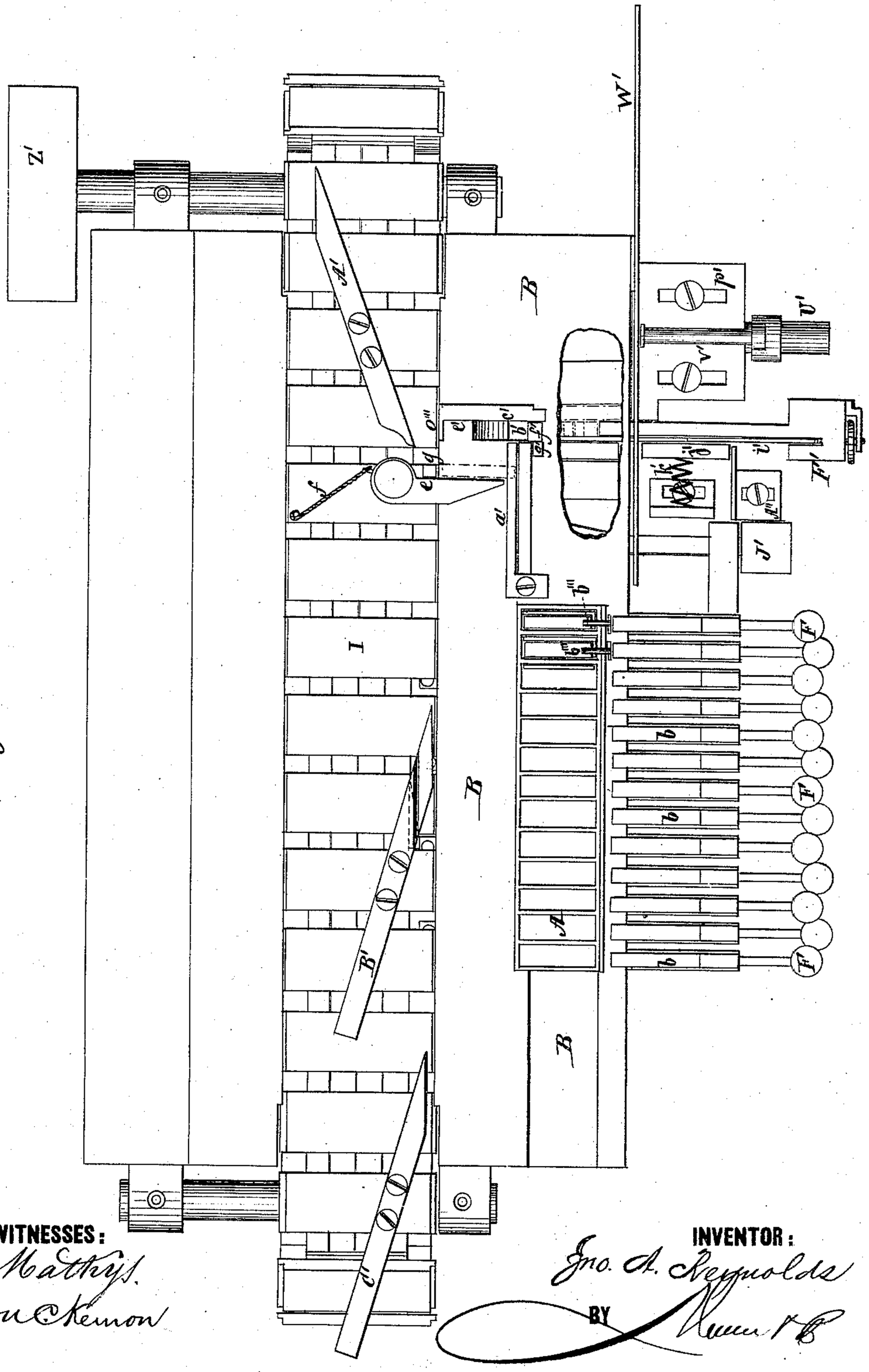

Fig. 2.

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Fig 3.

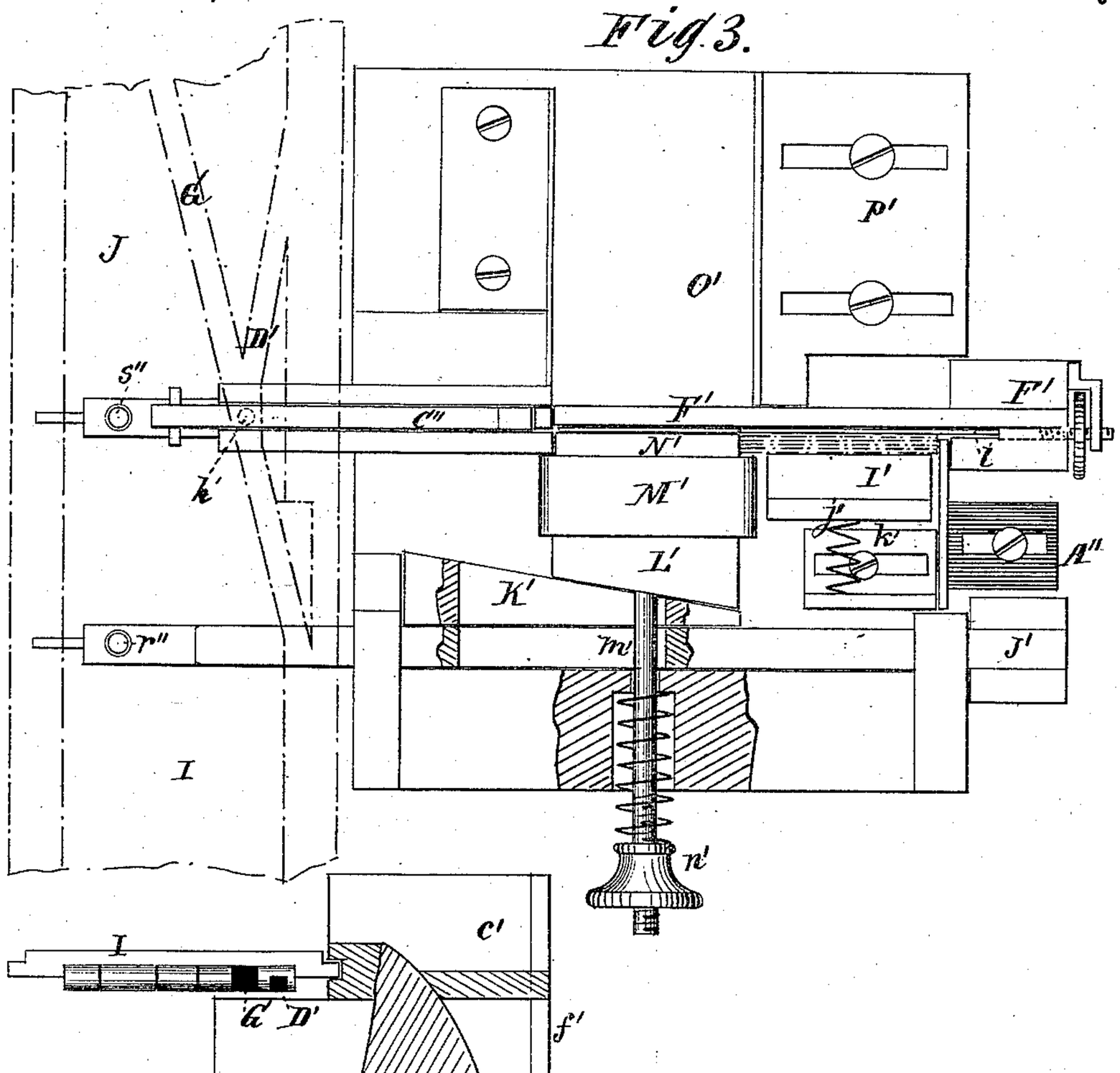

Fig 4.

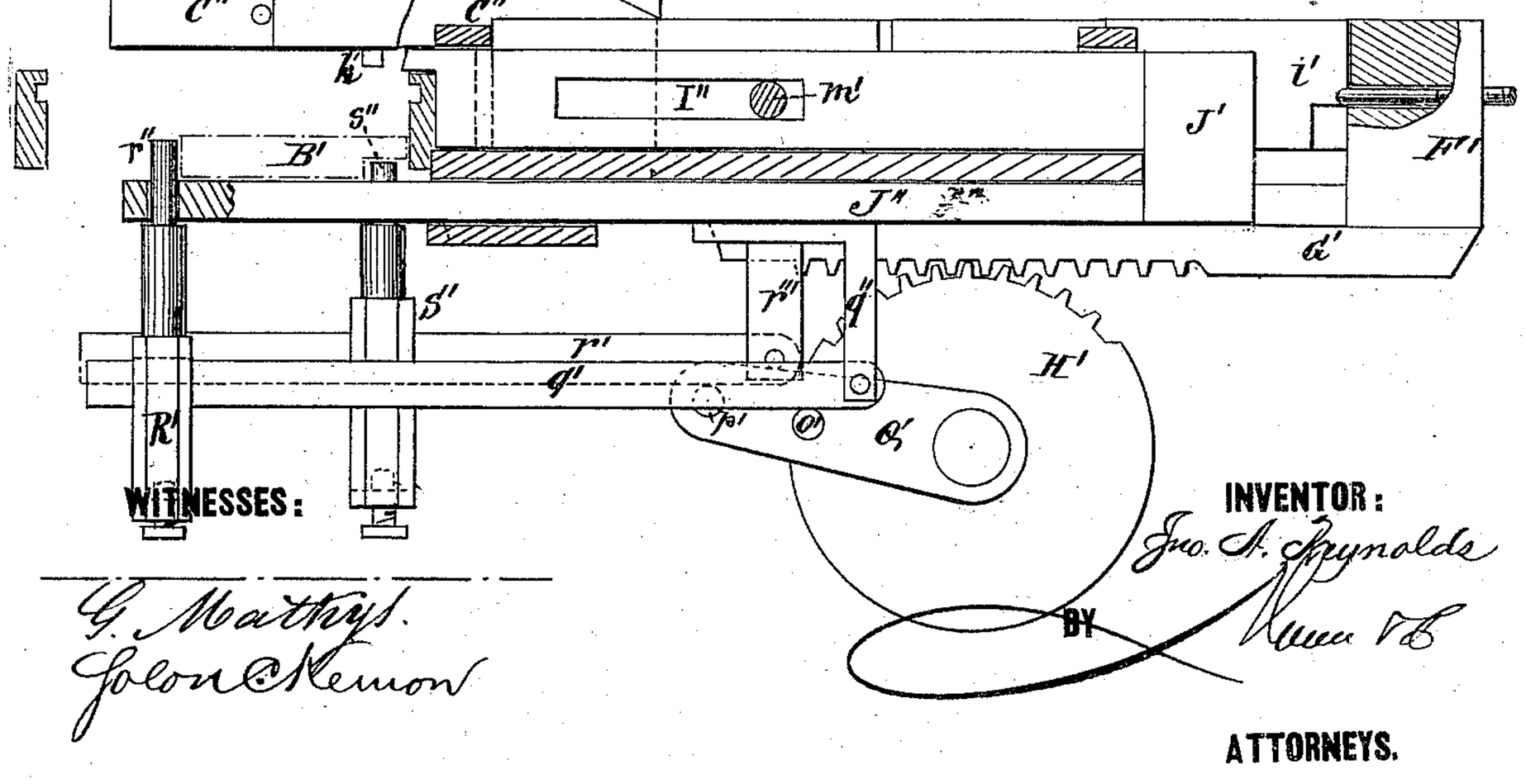

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Fig. 5.

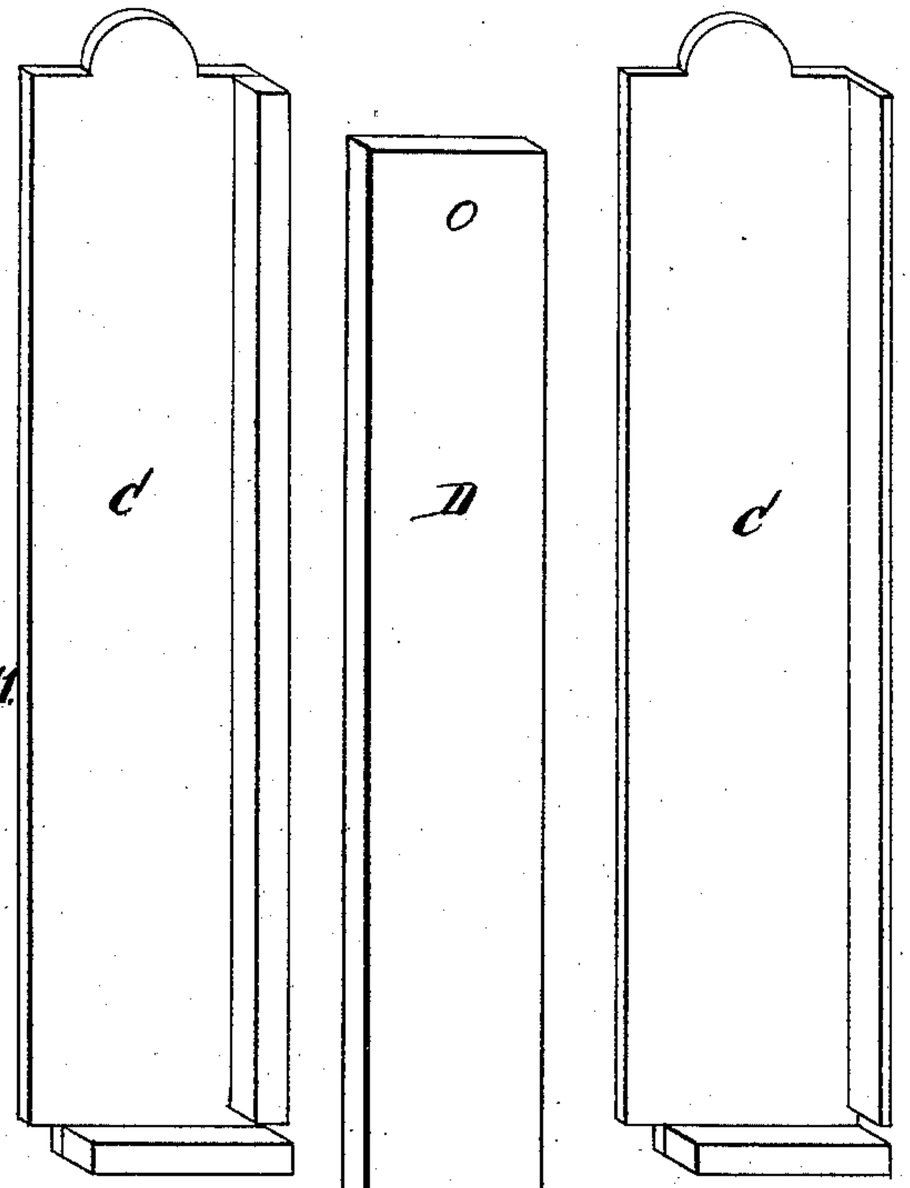

Fig. 5.

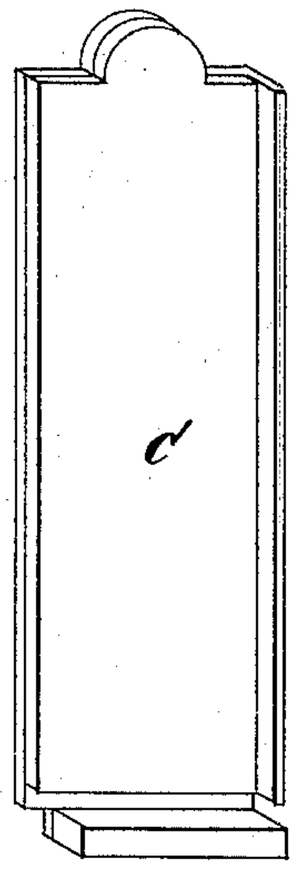

Fig. 8.

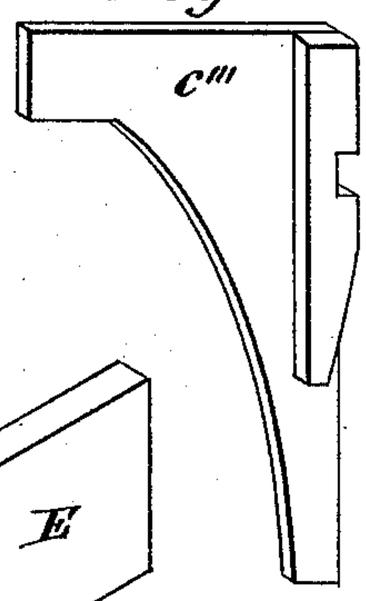

Fig. 9

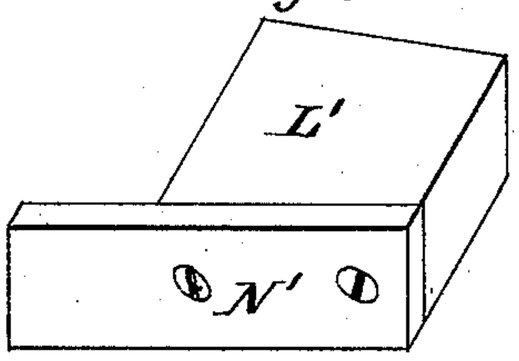

Fig. 12

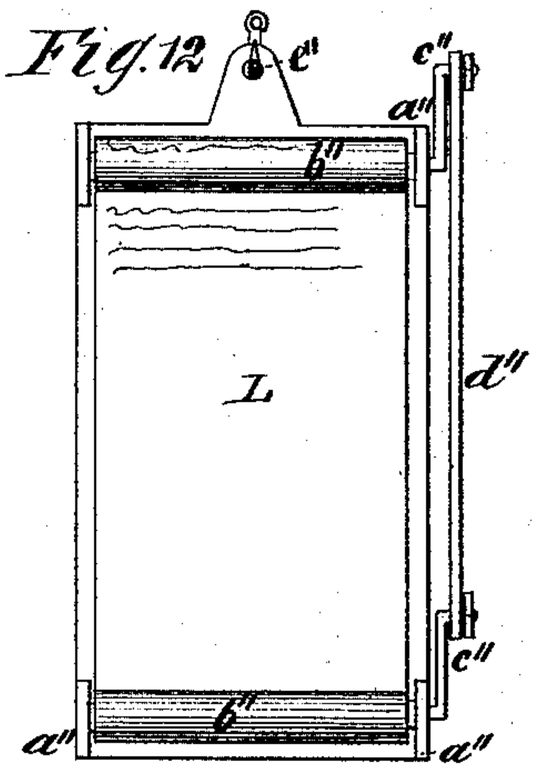

Fig. 6

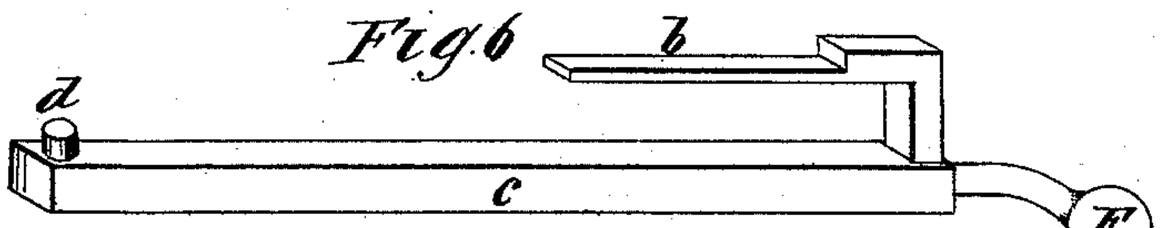

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Fig. 9.

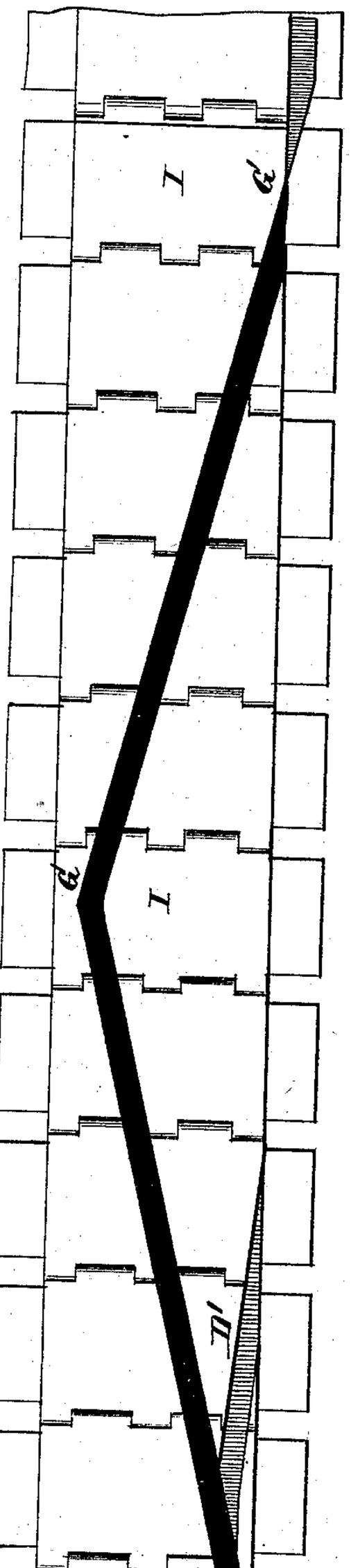
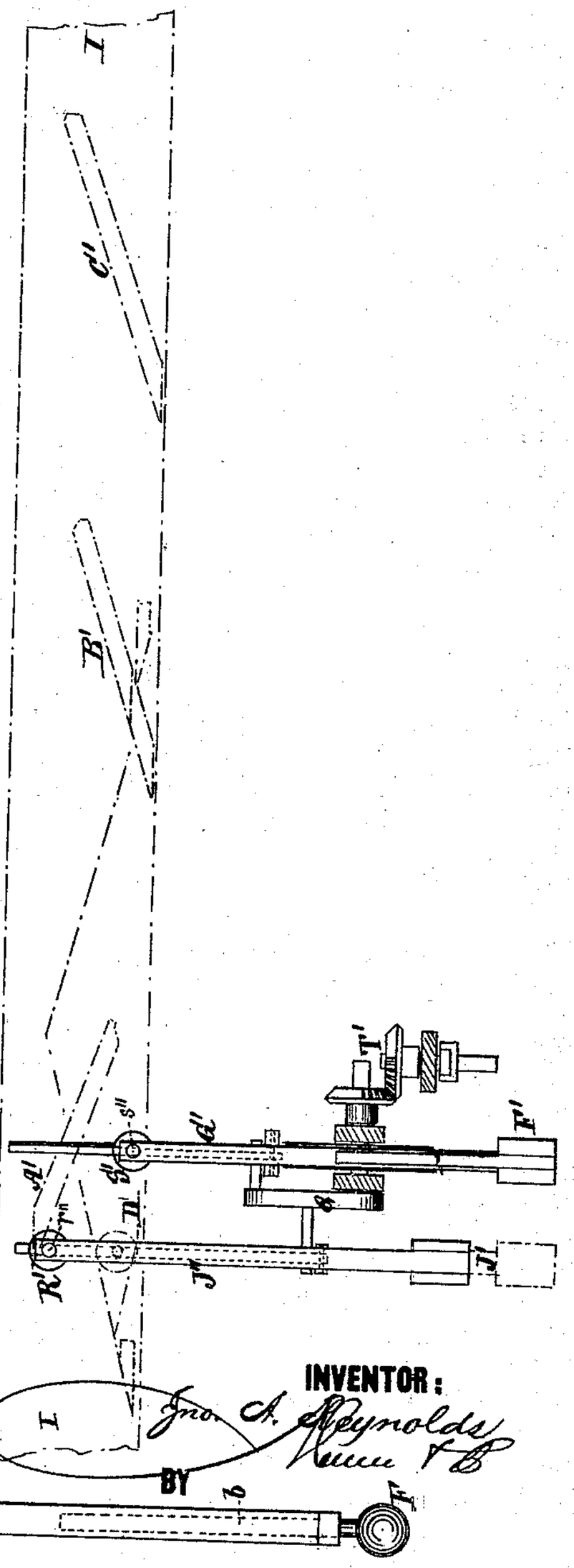


Fig. 10.



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UNITED STATES PATENT OFFICE.

JOHN A. REYNOLDS, OF DANVILLE, PENNSYLVANIA.

IMPROVEMENT IN TYPE-SETTING MACHINES.

Specification forming part of Letters Patent No. **152,868**, dated July 7, 1874; application filed May 14, 1874.

To all whom it may concern:

Be it known that I, JOHN A. REYNOLDS, of Danville, in the county of Montour and State of Pennsylvania, have invented a new and Improved Type-Setting Machine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings formirg a part of this specification, in which—

Figure 1 is a vertical side elevation of type-setter; Fig. 2, top view of the same; Fig. 3, plan view of the composing-stick and its connections with the belt, the top part of the machine being broken away; Fig. 4, sectional elevation of the same, with table and passage for the type shown; Fig. 5, the different dimensions of the same kinds of sticks for holding the type; Fig. 6, one of the keys with shaft and finger attached. Fig. 7 shows the relation of the shafts of keys to the cam-groove; Fig. 8, plate for adjusting the drop-passage for different-sized type; Fig. 9, the beveled block with adjustable plate for pushing the type into column. Fig. 10 shows the communication of the cam-bars with the bars J′ and F′; Fig. 11, the weight with bent rod that rests upon the column of types in the cases; Fig. 12, copy-holder.

This invention relates to that class of machines which are used for setting-type, and is a new and improved arrangement for doing the same by means of an apparatus which enables the operator to set type by a simple manipulation of keys as rapidly and much in the same manner that a performer on a musical instrument reads his notes and renders the music upon the key-board, the printer's copy corresponding to the musician's notes, and the keys of the machine to the key-board of the instrument. It consists in an arrangement of type (including letters, figures, spaces, reference and punctuation marks, &c.) in vertical cases, which vary in number and height, according to the number, variety, and demand for said different classes of type. Said vertical cases have lateral openings at their lower ends, through which the type are pushed out, by the fingers attached to keys, upon a table, along which they are carried by an arm attached to a metallic sectional hinged belt moving upon two pulleys to a slot in said table, through which they fall, passing down a curved passage into a recess, whence they are forced laterally by a slide into the composing-stick. The line which has thus been set up is then moved forward into column in the composing-stick by the automatic operation of a wedge-shaped cam, in combination with bars, levers, and pins. The operation of the machine is thus reduced to five mechanical motions—first, taking type from cases; second, carrying it along the table; third, dropping it through the slot; fourth, pushing it laterally in the line; and fifth, sliding the line into column. When said composing-stick is filled its contents are transferred to the galleys, to be set up in the form in the usual way.

In the drawings, Figs. 1 and 2, A represents the different-sized vertical cases, about one hundred and fifty-two in number in the full-sized machine, in which are arranged sticks filled by a distributing-machine with the different type. Said cases rest upon a table, B, and have openings *a* in their lower end, to allow a finger to enter at one side and push out the type through the other upon the table. In these cases slide the sticks C, which contain the type, said sticks being provided with a ledge or flange on one side and one at the bottom to hold the type, there being at the bottom of these sticks, in the side flange, an opening to allow the passage of the finger to push the type out on the table. Said sticks are of three kinds, those having a wide ledge being used for spaces, and those having a thick plate with a groove in the bottom to admit the same-sized finger as is used in the large type are used for small type. D is a rule, by means of which the printer clamps the type in the sticks when putting said sticks in or withdrawing them from the cases.

E represents a weight, which rests upon the top of column of type in the cases, so as to keep the type in a horizontal position and prevent them from rising up in the cases from the action of the fingers. Said weight E has attached to it a rod, *b‴*, which extends the length of the case, and is bent at the top, so that its other arm is parallel, and has at its extremity a flat surface, which serves to indicate the height of the type in the cases,

and also closes the holes in lower ends of cases when the type are all out, so that the fingers cannot enter, said rod having upon its flattened ends a character to indicate the letter and size of type in the case. F represents the keys, having fingers *b*, shafts *c*, and stems *d*. Said fingers are of different size, to suit the openings *a* in cases. Said shafts *c* slide in grooves in the bed-plate of the table B, and said stems *d* (when shafts are moved forward one-quarter of an inch by touching the keys) communicate with a grooved cam, G, on the inside of a hinged belt, I, which moves around the pulleys H H. The said hinged belt I moves in guide-bars J under the table, and in grooves in table B above, so that the upper surface of the belt is on a level with the surface of the table. Upon the top of this belt is pivoted arm *e*, which moves along the surface of table B with the belt. Said arm has attached to it a spring, *f*, and is kept in a proper position on the table by a lug, *g*. A′, B′, and C′ represent cam-bars, which are attached to the hinged belt in a diagonal position, B′ being of half the thickness of the others, and parallel with C′ A′, being placed at an angle to produce a motion to be counteracted by B′. On the top of the table B is a spring, *a′*, and near it a slot, *b′*, having a curved vertical passage for the type, formed by vertical plates *c′*, *d′*, and *e′*, and an adjustable bar, *f′*, fastened by a pin, *g′*. Plate *c′* has a flange, *o‴*, and is adapted to receive plates *c‴*, Fig. 8, which are intended to regulate the size of slot and passage for either large or small type. Underneath curved plate *c′* is a horizontal slide, C″, which moves between plates *c′* and *d′*, having one end beveled, so that the type will fall on this inclination and slide off of it in a flat position when slide is withdrawn. Underneath this slide C″ is a small stem, *h′*, which moves in another smaller grooved cam, D′, in the hinged belt, by means of which said slide is made to push the type laterally into position in the composing-stick O′. F′ is a horizontal bar, against the end of which the line of type is set up, which recedes as the type are pushed into the row. Said bar slides upon the surface of composing-stick, and is connected with another bar, G′, which slides in a groove under the table, and has a rack on its under surface, which meshes with the cog-wheel H′. Said bar F′ has placed at its side a thin adjustable plate, *i′*, for pushing in the leads between the rows of type. I′ is a compartment for the leads, having an adjustable slide, A″, an adjustable plate, *j*, and spiral spring *k′*, for forcing the leads into a position to be pushed out by the adjustable plate *i′*. J′ is another bar, parallel with F′, and attached to another bar, J″, below. To said bar J′ is attached a wedge-shaped cam, K′, with a longitudinal slot, I″, in it. Through this slot passes a rod, *m′*, which is attached to a block, L′, moving through the guide M′. To said block L′ is attached an adjustable plate, N′, which is of a length suited to the width of the column and thickness of lead used, and is used for moving up the line of type that has been set up to make room for the next. To rod *m′* is attached knob and spiral spring *n′*, by means of which block L′ is always kept tight against cam K′. O′ is the composing-stick, and P′ the adjustable slide, which, with adjustable plate N′, regulates the width of the column. To the shaft of cog-wheel H′ is attached the crank Q′, having arms *o′* and *p′*, which elevate levers *q′* and *r′*. Lever *q′* is pivoted in a support, *q″*, attached to bar J″ at one end, and moves in a slot at the other in a pin, R′, which it raises, causing said pin to pass upward through a hole, *s″*, in bar J″, and come into communication with cam-bars A′ and B′. Lever *r′* is pivoted to a support, *r‴*, attached to the bed of the machine at one end, and as it is raised by the arm *p′* it passes up a slot in pin S′, raising said pin through a hole, *s″*, in bar G′, and bringing it into communication with cam-bar C′. Any number of arms and cams may be used on this machine that the length of the hinged belt will admit of. To the shaft of cog-wheel H′ is attached a bevel-gear, T′, shaft U′ of said bevel-gear having an adjustable index-hand, V′, which moves over a graduated arc, W′, thus indicating the amount of type set up in a line on a magnified scale. Z′ represents a band-pulley, by means of which the machine is set in motion, and is operated either by a treadle or steam-power.

The operation of this machine is as follows: The type, which are distributed in sticks C by the distributing-machine, are placed in cases A, with the assistance of rule D, with the letters facing the belt G, the rule withdrawn, and weights E placed on top of them inside the cases. The key F is now touched, and the motion imparted to it throws the little stem *d*, Fig. 7, attached to shaft of key, into the grooved cam G in belt I, and as the belt revolves the shaft *c* is drawn under the table B, and the fingers *b*, Fig. 2, through the openings *a* in the vertical cases, pushing before them the type upon the table B. The said grooved cam G now, by a change in its direction, restores the finger and key to its former position by means of the said stem in the shaft. The arm *e*, attached to belt I, then comes along and slides the type laterally along table B to the slot *b′*, through which it falls, passing down said slot without turning edgewise, by reason of its support on plate *e* at its lettered end, the spring *a′* preventing the type from rebounding from plate *c*, and the flange *o‴*, preventing the arm *e* from interfering with the passage of type through slot. The type then passes by gravity, in a vertical position, down a curved passage, and falls upon its flat side on the beveled end of slide C″, with its lettered end up. The slide is then withdrawn by means of a stem, *h′*, that moves in another small grooved cam, D′, and the type, falling into the recess made by the withdrawn slide still maintains a vertical position. As the belt

moves on, this grooved cam D′ brings the slide C″ into its former position, and forces the type laterally against the bar F′, which, as it recedes to make room for it, moves the bar G′ with rack across the cog-wheel H′, turns the bevel-gear so much, and indicates on the graduated arc a magnified thickness of the type set by means of the index-hand V. This is to enable the operator to calculate the exact distance to the end of the line, so that he can more readily tell whether to finish the word on that line or carry it to the next. When the line has been filled, the bar F′ is pushed out as far as it will go, and in passing out carries bar G′ with the rack across the cog-wheel H′. This raises crank Q′, to which the arms *o′* and *p′* are attached. These arms raise the levers *q′* and *r′* in the slots of pins R′ and S′, and at the proper time elevate the pins also, raising pin R′ through the hole *r″* in bar J″ and pin S′ through the hole *s″* in bar G′. The cam-bar A′ then comes along on the belt, and, striking the projection of pin R′, forces inwardly pin, lever, bar J″, and bar J′, to which wedge-cam K′ is attached. Said cam, in passing in, imparts to block L′ a motion at right angles, forcing it (through guide M′) with plate N′ up the column just the width of the line of type. Cam-bar B′ then comes along, and, being much thinner than A′, passes over the projection of pin S′, which is made with a shorter shoulder than R′, and, being set at a different angle from A′, forces the projection of pin R′ in an opposite direction, thus restoring pin, lever, arm J″, and J′ with cam K′ to their former positions, the spiral spring *n′* restoring block L′ with plate N′ to their former positions. The cam-bar C′ now comes along, and, being set at an angle to produce the same effect on F′ that B″ does on J′, strikes the projection of pin S′, and draws pin, lever, bar F′, and G′ to their new position for next line of type, bar F being then tight up against the slide C″. This same motion also restores the index-hand to its former position by means of the bevel-gear and passage of the rack over cog-wheel H′, which, by lowering crank Q′ with arms *o′* and *p′*, allows the levers *q′* and *r′* with pins R′ and S′ to fall to their former position.

Having thus described my invention, what I claim as new is—

1. The combination of cases A, sticks C, and weights E, provided with bent rods *b‴*, substantially as and for the purpose specified.

2. A stick adapted to the dimensions of the smaller type, having a groove in its end for admitting the same-sized finger for pushing out the small type that is used for the large type, substantially as and for the purpose specified.

3. The cam-grooves G of the endless belt I, in combination with the fingers *b*, for the purpose of operating the same, substantially as and for the purpose specified.

4. The combination of the arm *e* with the spring *f*, lug *g*, and endless belt I, substantially as and for the purpose specified.

5. The cam-bars A′, B′, and C′, in combination with the endless belt I and pins R′ and S′, substantially as and for the purpose specified.

6. The spring *a′*, in combination with the type-conduit bed *e′*, substantially as and for the purpose specified.

7. The vertical plate *c′*, having flange *o‴*, in combination with plates *d′* and *e′*, bar *f′*, plate *c‴*, and the reciprocating slide C″, for forming an adjustable passage for the type, substantially as and for the purpose specified.

8. The combination of the beveled end and the straight face in horizontal slide C″, for holding the type in a flat position until said slide is withdrawn and type pushed into line by its return, substantially as and for the purpose specified.

9. The slide C″, in combination with the cam-groove D′ in the belt I, substantially as and for the purpose specified.

10. The combination of the bar F′, lever *r′*, pin S′, piece *s″*, and cam bar C′, substantially as and for the purpose specified.

11. The combination of the bar F′, rack G′, cog-wheel H′, crank Q′, and levers *q′* and *r′*, for the purpose of bringing pins R′ and S′ into communication with the cam-bars on the belt when said bar F′ has been pushed out by the line of type set up, substantially as and for the purpose specified.

12. The pin R′, in combination with the block L′ and adjustable plate N′, substantially as and for the purpose specified.

13. The pin R′, in combination with lever *q′*, arm *o′*, shaft J″ and J′, cam K′, block L′, with adjustable plate N′, and slide M′, for the purpose of advancing the line of type up the column after it has been set up, as described.

14. The combination of the adjustable plate *j′*, spring *k′*, and adjustable slide *t″*, for forming a compartment for the leads, substantially as described.

15. The adjustable plate *j′*, spring *k′*, and slide *t″*, in combination with the thin adjustable plate *i′*, attached to bar F′, substantially as and for the purpose specified.

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Witnesses:
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CHAS. A. PETTIT.