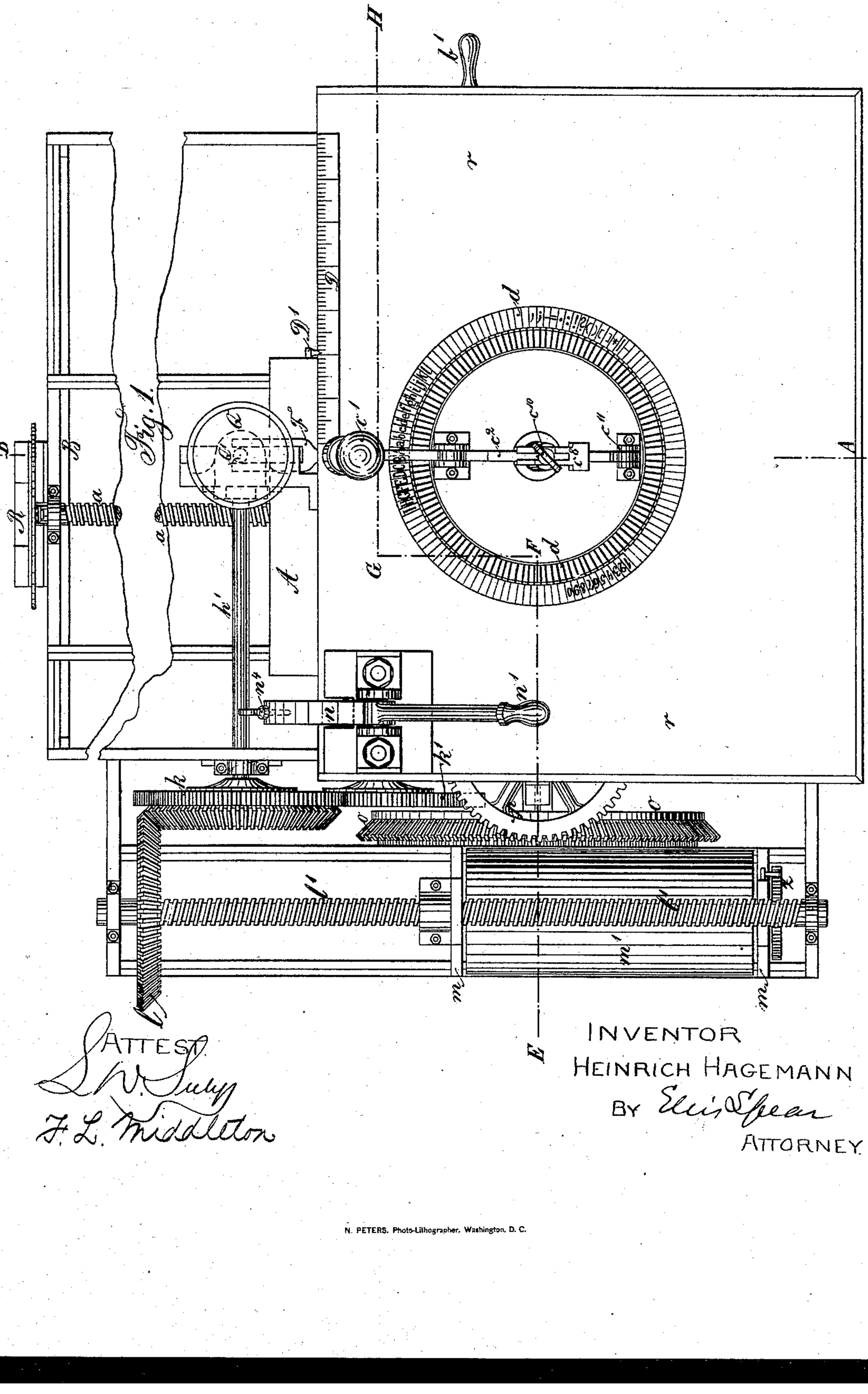
(No Model.) 5 Sheets—Sheet 1.

H. HAGEMANN.

STEREOTYPING MACHINE.

No. 270,056. Patented Jan. 2, 1883.



(No Model.) 5 Sheets—Sheet 2.

H. HAGEMANN.

STEREOTYPING MACHINE.

No. 270,056. Patented Jan. 2, 1883.

Fig. 3.

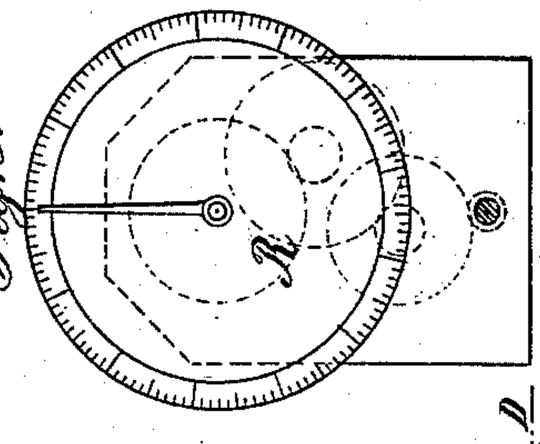


Fig. 2.

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Attorney

(No Model.)

5 Sheets—Sheet 3.

H. HAGEMANN.

STEREOTYPING MACHINE.

No. 270,056.

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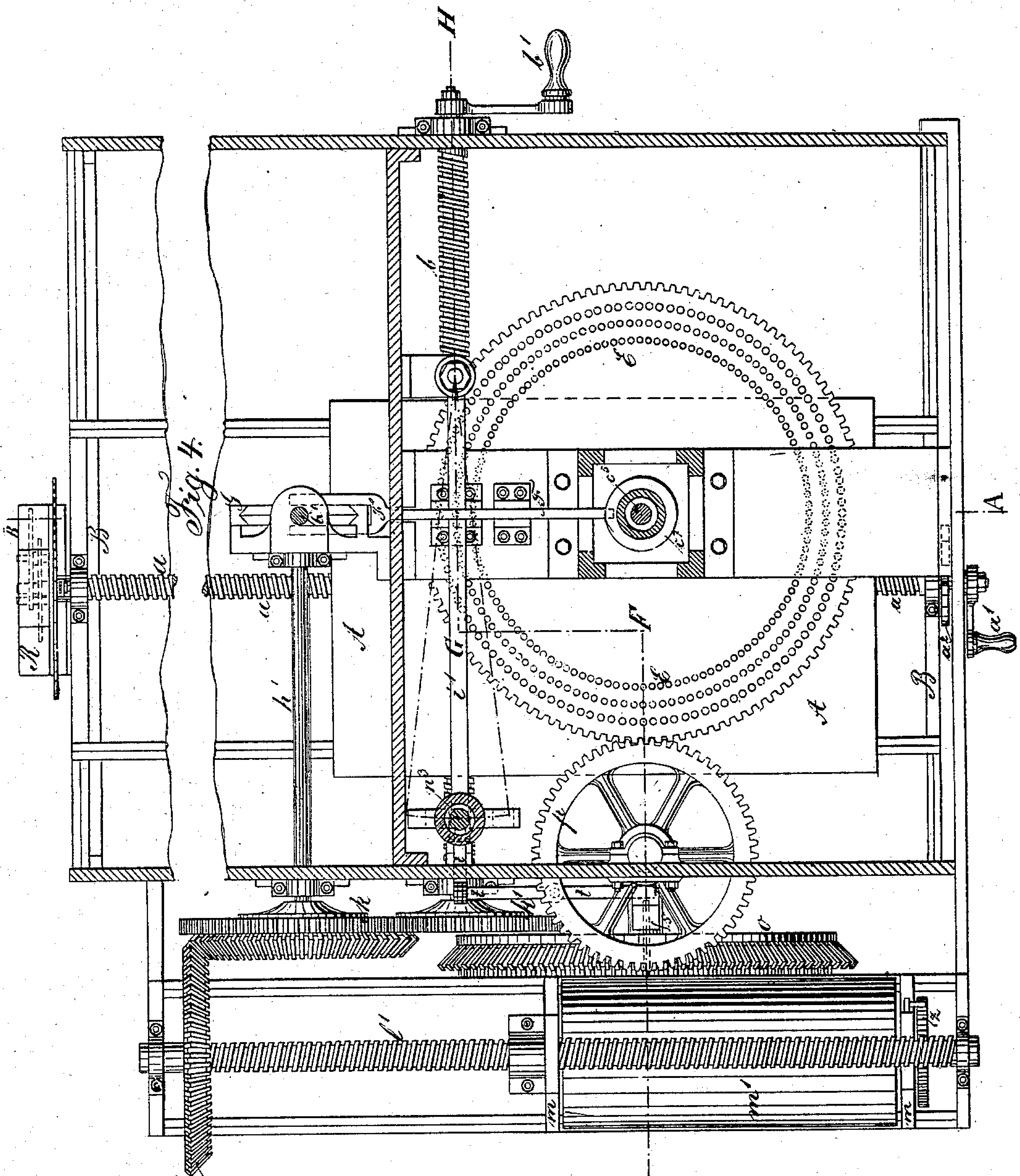

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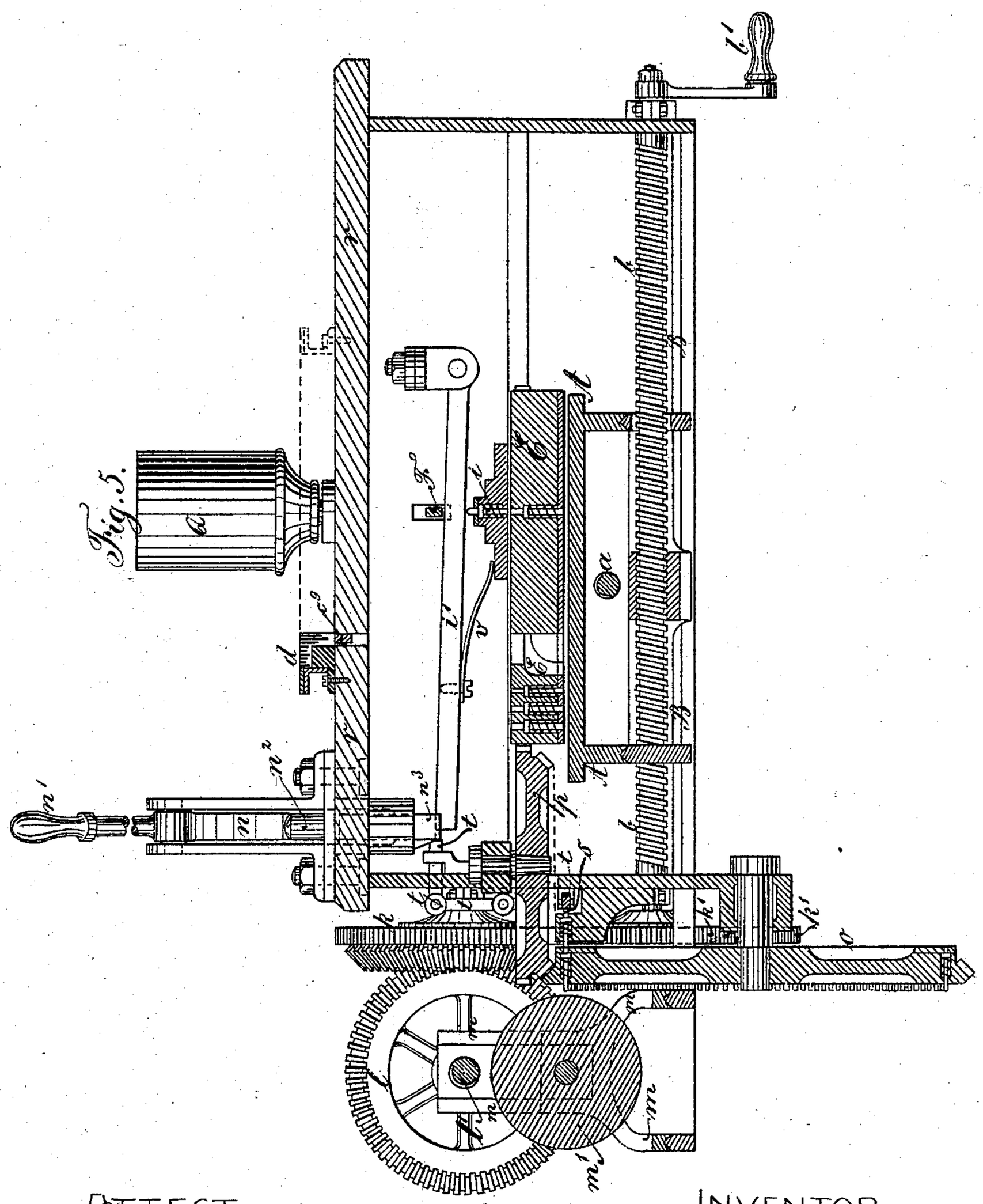
(No Model.) 5 Sheets—Sheet 4.

H. HAGEMANN.

STEREOTYPING MACHINE.

No. 270,056. Patented Jan. 2, 1883.



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(No Model.)

5 Sheets—Sheet 5.

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STEREOTYPING MACHINE.

No. 270,056. Patented Jan. 2, 1883.

Fig. 6.

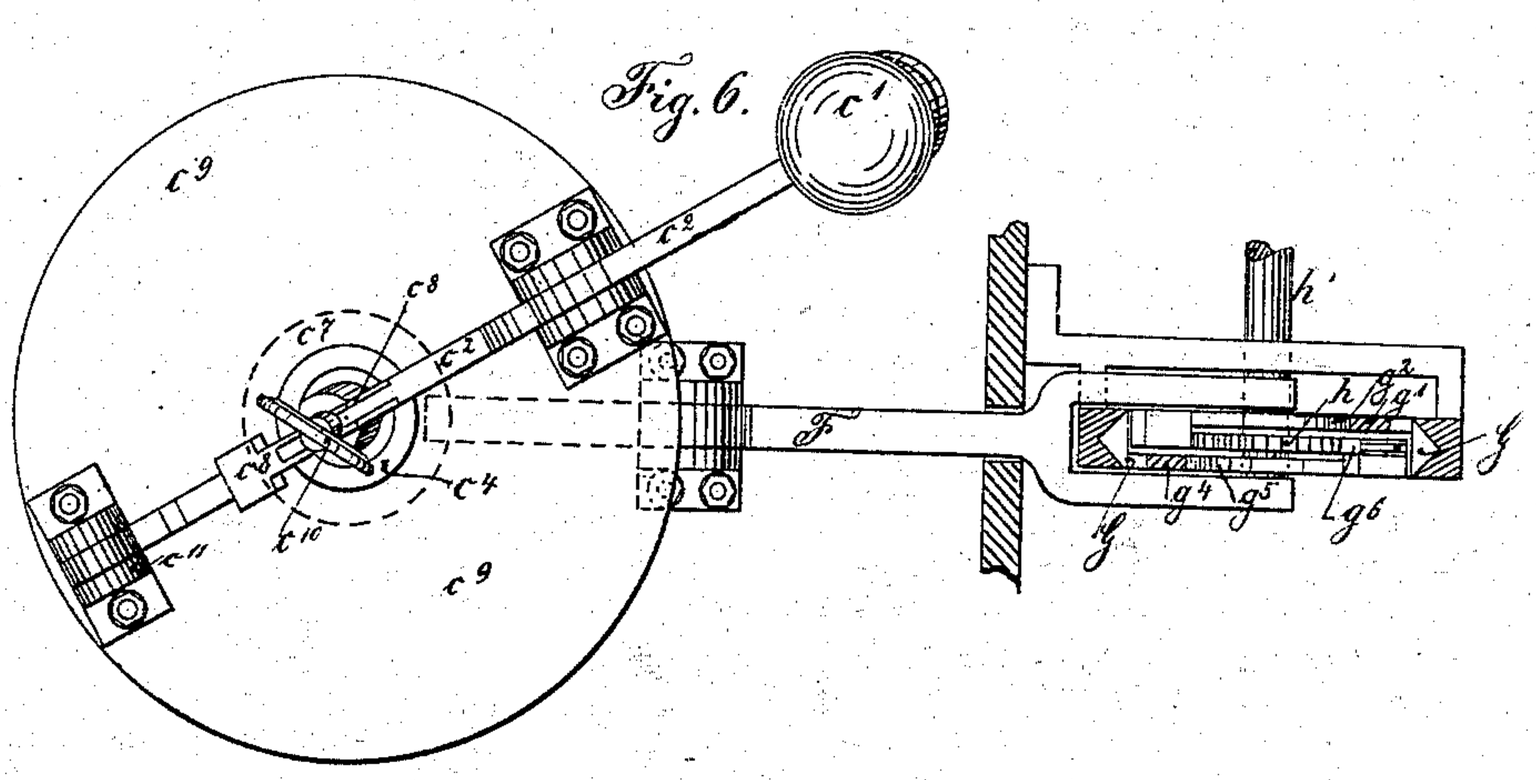


Fig. 8.

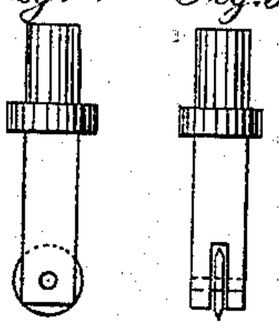
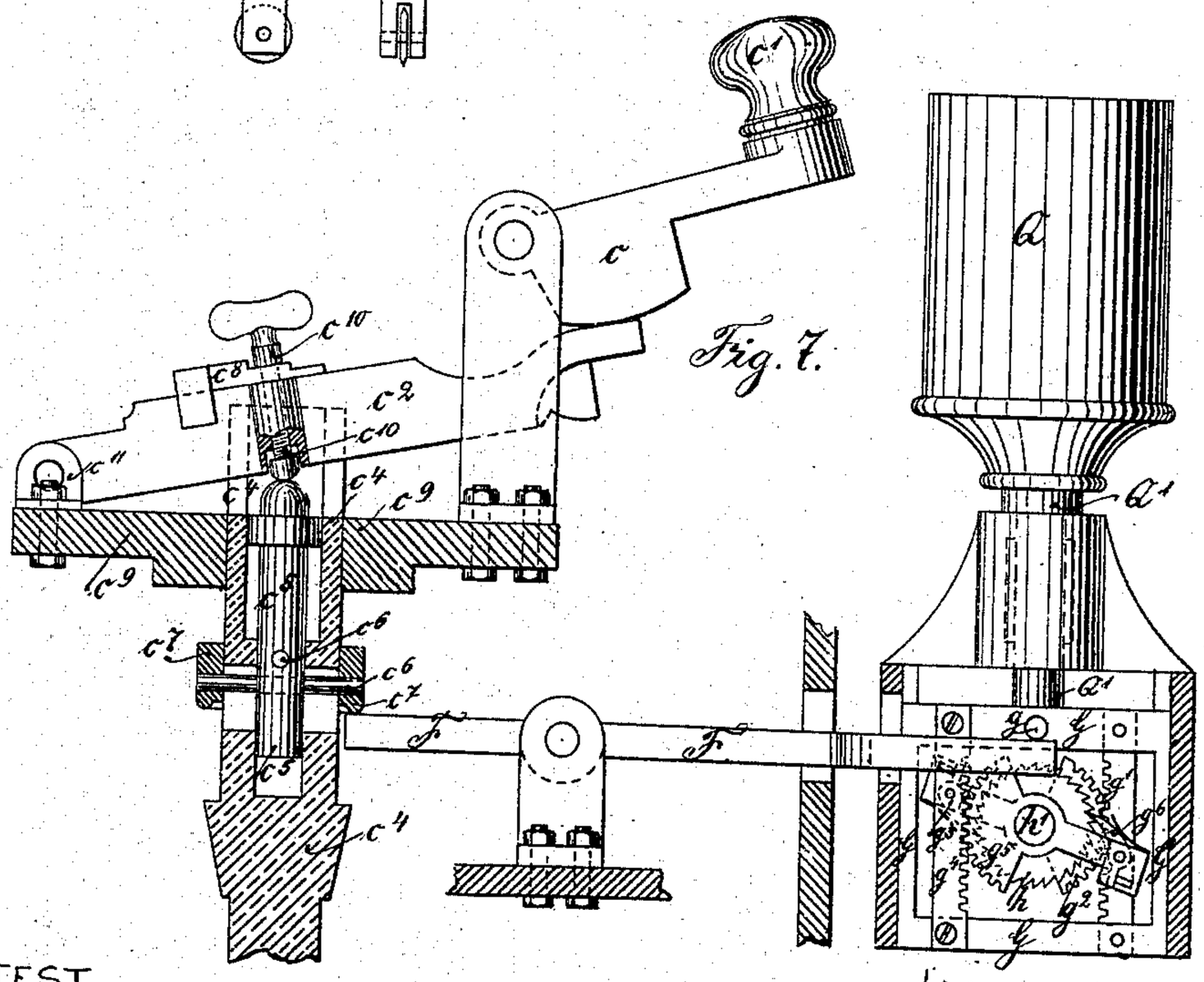


Fig. 9.

Fig. 7.



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UNITED STATES PATENT OFFICE.

HEINRICH HAGEMANN, OF VIENNA, AUSTRIA-HUNGARY.

STEREOTYPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 270,056, dated January 2, 1883.

Application filed March 7, 1882. (No model.)

To all whom it may concern:

Be it known that I, HEINRICH HAGEMANN, of the city of Vienna, Austria-Hungary, a subject of the Kingdom of Prussia, have invented certain new and useful Improvements in Machines for Stamping Type Molds or Matrices for Type-Founding; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the arts to which it appertains to make and use the same.

According to the method now in use the type is set by the compositor and such type pressed into suitable material to form a mold for the stereotype-plate. The stereotype-plate is cast from this mold and then used for printing purposes.

Now, the object of my invention is to avoid the work of the compositor and the heavy expense in type by means of a mechanical device, through the employment of which the molds or matrices are produced direct in the machine without the aid of compositors, and without any further stock of types than those contained in the machine.

Figure 1 is a plan or top view of the machine. Fig. 2 is a vertical section of Fig. 1 on the line A B. Fig. 3 is a front view of the indicating apparatus. Fig. 4 is a horizontal section on the line C D, Fig. 2. Fig. 5 is a vertical section on the line E F G H, Fig. 1. Figs. 6 and 7 show details of the apparatus or machine.

The object of this said machine is to press or stamp molds or matrices for casting type for printing, and at the same time to prepare a proof-sheet.

In order to accommodate the varying breadth of a letter, sign, or figure to this machine, so as to attain printed lines of equal length, the breadth or space occupied by a letter, sign, or figure is divided according to a fixed unit. Thus, according to the kind or size of type employed, a letter, sign, or figure would occupy one, two, three, or more such units.

The machine operates in the following manner: The material which is to be stamped or to receive the impressions is fixed on the slide A, and the paper for the proof-sheet on the roll m', Sheet 3. The slide A is carried by the slide-carriage B, Sheet 2, and is moved with the same in the direction of the lines by means of the screw or spindle b, and the movement of the slide A on the carriage B to the next following line is effected by means of the screw-spindle a. The screw-spindles a and b are turned or put in motion by means of the handles or cranks a' b', and thus the slide A is adjusted to any desired position. In order to enable a letter, sign, or figure to be impressed, the lever c^2 is, by means of the handle c' of the eccentric c, adjusted over the desired letter, sign, or figure of the stationary ring d, Sheets 1 and 2, which is attached to the top plate, r. The lever c^2 is by means of its bearing c'', attached to the disk c^9, which latter is so fixed to the pivot or axle c^4, which forms the axis for the disk c^9, type-drum E, and the other revolving parts of the apparatus that the said disk c^9 and pivot or axle c^4 turn round or revolve with the lever c^2.

The representations of the letters, signs, and figures which are contained in the type-drums E and o are marked on the outer upper side of the ring d. When the lever c^2 is turned the axle or pivot c^4 is also turned, and with it the horizontal type-drum E, which is firmly attached to the said pivot or axle c^4. In this said horizontal type-drum E the whole of the types or dies composing the alphabet, signs, and figures, which are represented on the ring d, are fixed upon pins, which are supported by spiral springs. These types or dies can be arranged in any desired number of rings or circles. Three such rings or circles of type are shown in the accompanying drawings, and each ring or circle contains a different kind or set of type. The type or die corresponding to the letter, sign, or figure of the ring d, over which the lever c^2 has been moved or adjusted, takes up a position immediately underneath the pin i, which said pin i is supported in the machine on spiral springs.

By means of the teeth with which the periphery of the horizontal drum E is provided its revolving motion is transmitted to the toothed wheel p, Figs. 4 and 5, and this wheel p, by means of conical teeth, causes the vertical type-drum o to revolve. The vertical type-drum o contains the same arrangement of types or dies as the horizontal drum E, (in the drawings only one row of type is shown,) so that the type corresponding to the said type immediately underneath the pin i in the horizontal drum E is in the vertical drum o in front of

the pin *s*. The vertical drum *o*, however, can also be provided with the various sorts or kinds of type as in the horizontal drum E.

The eccentric *c* is depressed by means of the knob or handle *c'*, and thus the tongue c^3 of the lever c^2 is pressed into that slot of the ring *d* which belongs to the letter, sign, or figure which is to be impressed in the matrix. The depth of these said slots is so arranged that the same corresponds with or stands in a fixed proportion to the one half of the face of the letter, sign, or figure to which it belongs plus half the space between two letters. This depression of the lever c^2, and the consequent entry of the tongue c^3 in the slot, as later on described, causes the slide B to move forward in the direction of the line exactly the distance corresponding to the space occupied by half the breadth of the letter, sign, or figure which is desired to be impressed plus half the space between two letters. By the depression of the lever c^2 the pin c^5, situated in the interior of the hollow axle c^4, is also depressed. The pin or pivot c^5 is attached at its lower extremity to the ring c^7 by means of two pins, c^6, which run at right angles to each other through the said pin or pivot c^5.

The axle c^4 is provided with slots at that part where the pins c^6 are situated, so that the pin c^5 and the ring c^7, which is attached to the said pin c^5 by means of the pins c^6, may freely move up and down. The ring c^7 presses on the lever F, which is forked at its opposite extremity, Figs. 2 and 4. This fork is situated underneath the pin *g* of the frame G, which slides up and down between guides. When the pin c^5 is depressed the frame G, with the weight Q above it, is raised. This motion of the frame moves the rack *g'*, which is attached to or which forms the back of the same. The racks *g'* gear into the toothed sectors g^2, the opposite end of which forms the bearing for the pivot of the pawl g^3. This pawl g^3 gears into the ratchet-wheel *h*, and this being firmly fixed to the axle or shaft *h'* the said shaft *h'* is caused to revolve in the direction indicated by the arrow, Fig. 2. The teeth of the ratchet-wheel *h* bear a certain proportion to the depth of the slots in the ring *d*, and the width of one tooth corresponds to the unit upon which the division of the breadth of the letters, signs, and figures is based. The deeper the slot in the ring *d* in which the tongue c^3 of the lever c^2 is pressed the further the ratchet-wheel *h* is caused to revolve; or, in other words, the motion of the ratchet-wheel *h* corresponds to the depth of the slot of the ring *d*, in which the tongue c^3 is pressed.

The ratchet-wheel *h* is, as already stated, fixed to the shaft *h'*, on the opposite extremity of which a toothed wheel, *k*, provided in front with bevel-teeth, is so attached that this said toothed wheel performs the same revolutions with the ratchet-wheel *h*. The toothed wheel *k* transmits its revolutions to the toothed wheel *k'*, and this said wheel *k'*, being fixed to the screw-spindle *b*, causes the same to revolve, Fig. 4, and this effects the movement of the slide-carriage B with the slide A, which rests upon the said slide-carriage B. This said movement takes place in the direction of the line to be printed and corresponds to the depth of the slot in the ring *d*, which is equivalent to the one half of the letter, sign, or figure which is to be impressed plus half the space between two letters. The toothed wheel *k* transmits further, by means of the miter or bevel teeth on the same, its revolving motion to the wheel *l*, and this wheel *l* being fixed to the shaft or screw-spindle *l'*, the latter is also caused to revolve. By means of the said screw-spindle *l'*, which has the same pitch as the screw-spindle *b*, the bracket *m*, with the roller *m'*, which is supported by it, are also moved in the direction of the line to be printed, this movement being equivalent to that which the screw-spindle *b* causes the slide-carriage B to perform.

After the slide-carriage B and the roller *m'* are brought into correct position by means of the lever C^2, the type of the horizontal drum E is impressed in the material of the matrix, and at the same time, by means of the type of the vertical drum *o*, the same letter, sign, or figure is printed on the proof-sheet, which is wound round the roller *m'*. This double impression is caused by moving the eccentric *n* round its axle, which is done by means of the handle *n'*, which is grasped by the left hand, so that the said eccentric *n* presses upon the pin n^2. This pin n^2 is firmly attached at its lower end to the cross-piece n^3, which said cross-piece is provided with recesses or slots, equal in number to the different kinds or rows of type employed. The cross-piece n^3 presses upon the lever *i'*, Fig. 4, Sheet 3, and this depresses the pin *i*, and thus the type of the horizontal drum is impressed into the material of the matrix, which is fixed on the slide A. At the same time the depression of the pin n^2 and the cross-piece n^3 causes the corresponding type to be printed by means of the pin *s*, Fig. 5, Sheet 4, of the vertical drum *o* on the proof-sheet, which is wound round or attached around the roller *m'*. This pin *s* is acted upon by means of the lever combination *t*, Figs. 4 and 5, which is put into action by means of the inclined or wedge-like projection on the cross-piece n^3.

The ends of the type of the vertical drum, which are engraved with the letters, signs, or figures, project beyond the surface of the said drum *o*, so that during the revolution of the same they may be provided with printing-ink from rollers placed in suitable position, so as to have the printing on the proof-sheet in ink. These rollers are not shown in the drawings.

When the eccentric handle *n'* is reversed the following action ensues: First, the lever *i'* and pin n^2 are raised by the action of the spring *r*, Fig. 5, so that the type of the horizontal drum E, the pressure having been removed, is withdrawn from the matrix by means of its spiral spring, and at the same time the pin *i* is also raised by means of its spiral

spring; second, the lever combination *t* is, by means of a spring provided for that purpose, pressed back into its former position, and the pressure being removed the type of the vertical drum *o* and the pin *s* are by means of their spiral springs withdrawn into their former positions. After this the eccentric knob *c'*, which has been depressed by the right hand, is released. This allows the counter-weight Q to press its pin Q' down as far as the shoulder or collar, and consequently the frame G with it. The rack g^4, which is attached to or forms the front side of the frame G, now causes the toothed sector g^5 to make a partial revolution, which said sector can move freely on the shaft or axle *h'*, Figs. 6 and 7. The action or effect of the counter-weight Q can be effected by a lever, spring, or other suitable arrangement. This partial revolution of the toothed sector g^5, and consequently the pawl g^6, the bearing of which can be of one piece with the toothed sector g^5, causes the ratchet-wheel *h* to turn round in precisely the same direction as occurred upon the depression of the eccentric knob *c'*, as afore described. As the revolution or partial revolution of the ratchet-wheel *h* is transmitted to the shaft or axle *h'*, and consequently to the toothed wheel *k*, the same effect is attained by releasing the eccentric knob or handle *c'* as was effected by the depression of the same—viz., the slide-carriage B and the roller *m'* are caused to advance in the direction of the line to be printed, such advance being equivalent to half the space occupied by the letter or type just impressed plus half the space between two letters.

In order to impress the next letter, sign, or figure in the matrix and to print the same on the proof-sheet, the before-described operations are repeated.

In order to attain the adequate space between two words, the lever c^2 is depressed by means of the knob *c'* into one of the slots of the ring *d*, and again released without a type being impressed in the matrix. By the combined action of the eccentric-knob *c'* and the counter-weight Q the desired space is obtained. After the completion of a line the pawls g^3 and g^6, which are pressed into gear with the teeth of the ratchet-wheel by means of springs, are put out of gearing by means of keys or wedges provided for that purpose, and the slide-carriage B and the bracket *m* screwed backward in the direction of the line by means of the screw-spindle *b*, which is turned by the handle or crank *b'*. After this the slide A alone—that is, without the slide-carriage B—is moved a distance equal to the space between two lines, this being effected by the screw-spindle *a*, which is turned by the handle or crank *a'*. In order to be able to commence a fresh line on the proof-sheet, the roller *m'* must be also turned a distance equal to the space between two lines. In order to perform this exactly, a ratchet-wheel or a disk provided with suitable notches, Z, is employed, in the recesses or notches of which a pawl with a spring works, and which said wheel or disk *z* is attached to the same shaft or axle that carries the roller *m'*. After these operations are performed and the two pawls of the shaft or axle *h* are again put into gear a fresh line of printing can be begun.

By means of the set-screw n^4 the movement of the eccentric *n* can be regulated, and the depth of the impressions of the type of the horizontal drum in the matrix varied at pleasure.

When it is desired to work with another kind of type it is necessary—

First. To adjust the lever *i'*, which is capable of being moved horizontally and vertically round its pivot into another recess of the cross-piece n^3. Thus the said cross-piece n^3 is caused to cover a different pin, *i*, which said pin depresses the letters, signs, or figures of the desired row or ring of type of the horizontal drum E.

Second. To loosen the pressure-screw c^{10} and to adjust the step wedge-piece c^8 of the lever c^2 to correspond to the amount of advance required by the new type and then to retighten the said pressure-screw c^{10}. The various thicknesses of the step wedge-piece c^8 enables the advance of the slide-carriage B and that of the roller *m'* to be adjusted according as the type contained in the horizontal drum E requires it.

In order to be able to rule lines with the machine, special types or dies of the horizontal and vertical drums E and *o* are provided with small rollers for vertical as well as for horizontal lines, Figs. 8 and 9. When it is required to impress a line the lever c^2 is turned by means of the eccentric knob or handle *c'* to the slot of the ring *d*, which represents the type or die of the line. This causes the type-pin, with the roller or small wheel, to place itself underneath the pin *i* of the horizontal drum E and in front of the pin *s* of the vertical drum *o*. The wheel or roller is now pressed into the matrix and onto the proof-sheet by means of the eccentric handle *n'*, and the slide-carriage B and roller *m'* are advanced in the desired direction. This causes the one wheel to cut or impress a line in the matrix, while the other wheel prints an ink-line on the proof-sheet.

The advance of the slide-carriage B and the roller *m'* for ruling lines in the horizontal direction can be effected in two different manners: first, by continually depressing and releasing the lever c^2 by means of the eccentric knob or handle *c'* until the line has received the desired length, the left hand during this time holding the eccentric *n'* depressed, so that the type of the horizontal drum, which is provided with the wheel, cuts continually into the matrix, and the corresponding type of the vertical drum uninterruptedly prints the line on the proof-sheet; second, by causing the slide-carriage B and roller *m'* to advance by means of the screw or spindle *b* and crank *b'*, the respective types of the horizontal and vertical drums being, as before, depressed or protruded by means of the eccentric handle *n'*, in the manner previously described.

In order to rule vertical lines, the lever c^2 is adjusted to the proper position of the ring d, after which the type or die, with the wheel, is depressed by means of the eccentric n'. Then the slide A is advanced by turning the screw-spindle a by means of the handle or crank a', whereby the wheel cuts or impresses the line in the matrix. If the vertical line is required on the proof-sheet, the roller m' must be turned the necessary distance by means of the check-wheel or notched disk z.

A scale, D, is marked on the top or upper plate, r, and a pointer, D', is fixed to the slide-carriage B, which said pointer travels with the said slide-carriage and indicates on the scale the position in the direction of the line which the said slide-carriage occupies.

The indicator R, which is in connection with the screw-spindle a by means of tooth-wheels, serves to show continuously the position which the slide A occupies. This is shown on the graduated ring, the divisions of which correspond to the space between the lines. The indicator thus enables the slide A to be adjusted to any desired line by means of the handle or crank a'.

As the different kinds of type require different spaces between the lines, the following arrangements are made:

First. A ratchet-wheel or a disk, a^2, Figs. 2 and 4, provided with a suitable number of notches in its periphery, is fixed on the screw-spindle a. A spring catches in the notches or cavities of this wheel or disk, by which means the desired partial revolution of the screw-spindle a is regulated.

Second. The graduated ring of the indicator arrangement R can be exchanged for another the divisional unit of which corresponds to the desired distance between the lines.

In order to print with more than the ordinary space between the letters, a greater advance of the slide-carriage B is caused by means of the step wedge-piece c^8, which causes the letters to be impressed further apart from each other.

An incorrectly stamped or impressed matrix can be repaired or corrected in two different ways: first, by cutting out the piece to be corrected, stamping the correct sentence, word, or type on another piece of matrix material, letting the same into the original matrix, and gluing or otherwise attaching the corrected matrix onto a piece of paper or other suitable material; second, by affixing paper or other suitable material over the spot to be corrected by means of gum or other adhesive material, and by placing the matrix in its original position, then adjusting the slides by means of the cranks or handles a' b', and stamping the desired correction in the paper or other material affixed to the matrix, as aforementioned. The correction of an incorrectly stamped or impressed matrix would not be possible if the breadths of the letters, signs, and figures were not divided according to a definite unit. The exact position of the slide A for the purpose of correction is indicated in the direction of the line by the scale D, and its position with regard to the consecutive order of the lines is shown by the hand or indicator on the graduated ring belonging to the indicator arrangement R.

In order to distinguish the spot on the proof-sheet where the correction is required, paper is employed for the proof-sheet which is ruled vertically with lines corresponding to the unit upon which the division of the widths of the letters, signs, and figures is based, and horizontally with lines corresponding to the spaces required between the lines to be printed. The matrix material can be also covered with paper ruled in the same manner.

Having now described my said invention and the manner in which the same is to be carried into effect, I desire it to be understood that the component parts of my said invention may be modified without departing from the tenor of my said invention; but

What I claim, and desire to have secured by Letters Patent, is—

1. A machine for pressing or stamping type-molds for stereotype-plates, consisting, in its main elements, of a plate or carriage and mechanism for giving said plate linear and interlinear motions, a type-carrying wheel having an annular row of type set upon springs in said wheel, a surface-ring provided with characters and slots corresponding in position to the type, a lever pivoted within said ring to a part connected to the shaft of the type-wheel, a plunger connected with suitable devices for operating the feed mechanism, and a separate handle and plunger and connecting mechanism, substantially as described, for depressing the type, whereby any one of the type may be brought into position and pressed into the material to be molded, substantially as described.

2. In combination with a machine for pressing or stamping type-molds for stereotype-plates having a type-wheel carrying the type, mechanisms, as described, for rotating said wheel and for depressing any one of the type in said wheel, whereby the type are brought into alignment with the material, supported and moved, as described, on a plate or carriage and impressed upon said material, a drum adapted to carry a proof-sheet, mechanism for giving said drum linear and interlinear movement, a type-wheel carrying movable type adapted to print upon the proof-sheet upon the drum aforesaid, a lever adapted to act upon all of said movable type one at a time, and intermediate mechanism, substantially as described, between said lever and the lever which operates the stamping-type, whereby the molds are impressed and the proof-sheet printed simultaneously, substantially as described.

3. In a machine for stamping molds for stereotype-plates, a wheel, E, carrying movable type set upon retracting-springs, a lever, c^2, connected to the shaft of said wheel to turn the same, a plunger arranged in the axis of the shaft, operated by depression of the lever c^2 to

produce linear movement, a handle, n', lever i', and the intermediate devices adapted to operate a spring-plunger, i, for depressing the type, substantially as described.

4. The combination, in a machine for stamping type-molds for stereotype-plates, of the wheel for carrying the type, and mechanism, as described, for rotating said wheel and for depressing a plunger in the axis of said wheel, the lever F, the shaft h', and the frame-carrying mechanism, as described, whereby the reciprocating motion of lever F is caused to turn said shaft h', the weight Q, and the gearing connecting said shaft h' to the feeding mechanism, all substantially as set forth.

5. In combination in the described machine, the wheel E and its stamping mechanism, the wheel o and its printing mechanism, the connecting-wheel p, the slide A and roll m', and the described mechanisms for moving said slide and roll, and the described type-moving mechanisms, whereby the molds are impressed and a proof-sheet printed simultaneously, as set forth.

6. In the described machine, a type-wheel, E, having a plurality of rows of movable type concentrically arranged, plungers i, and shifting-lever i', in combination with the described mechanism for depressing the said lever, whereby any one of the rows of type may be operated, substantially as described.

7. In the described machine, the combination of the lever i, adapted to shift over a plurality of rows of type or dies, the plunger n^2 and eccentric n, part n^3, the lever F and its described connection with the plunger c^5, lever c^2, step-wedge c^8, and tightening-screw c^{10}, the latter being adapted to regulate the advance of the carriage B, a roller, m', according to the type employed, as set forth.

8. The combination, with the plunger n^2 and the intermediate connections between it and the plunger i and movable type, of the set-screw n^4 and cam n, whereby the depth of the impression is regulated, as set forth.

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Witnesses:
EDWIN A. BRYDGES,
JOHN O. TONKIN.