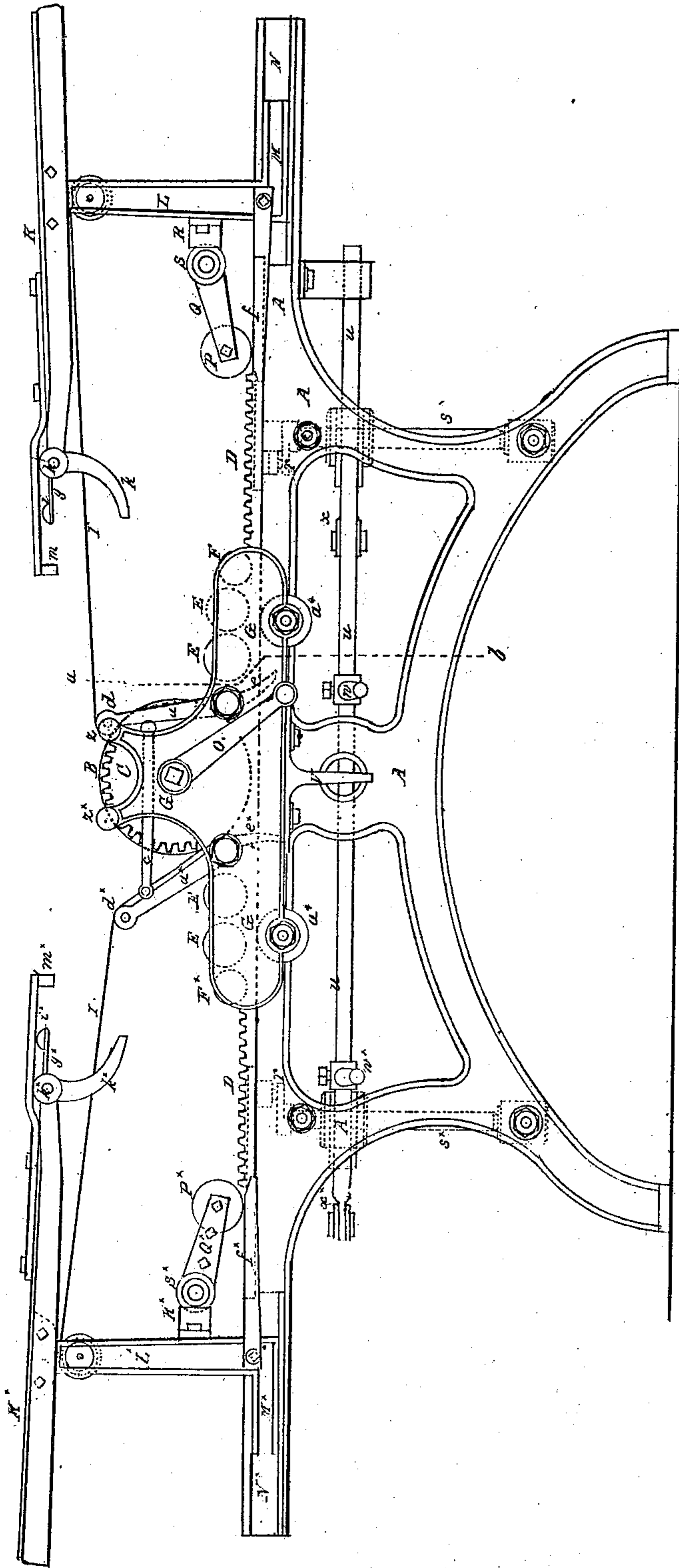


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Patented Sept. 10, 1840.

Fig. 1



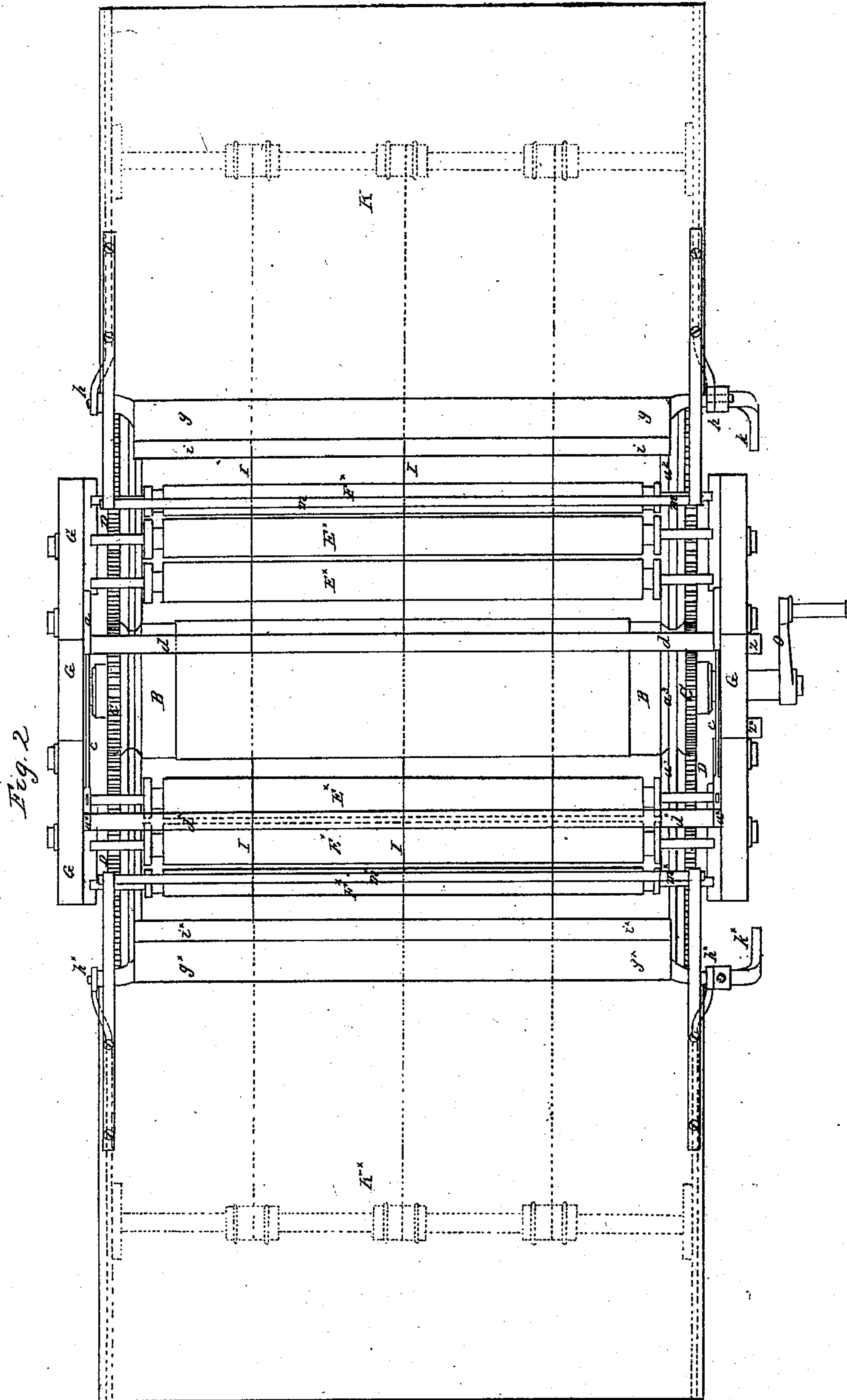
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Amos Mabley *Andrew Smith*

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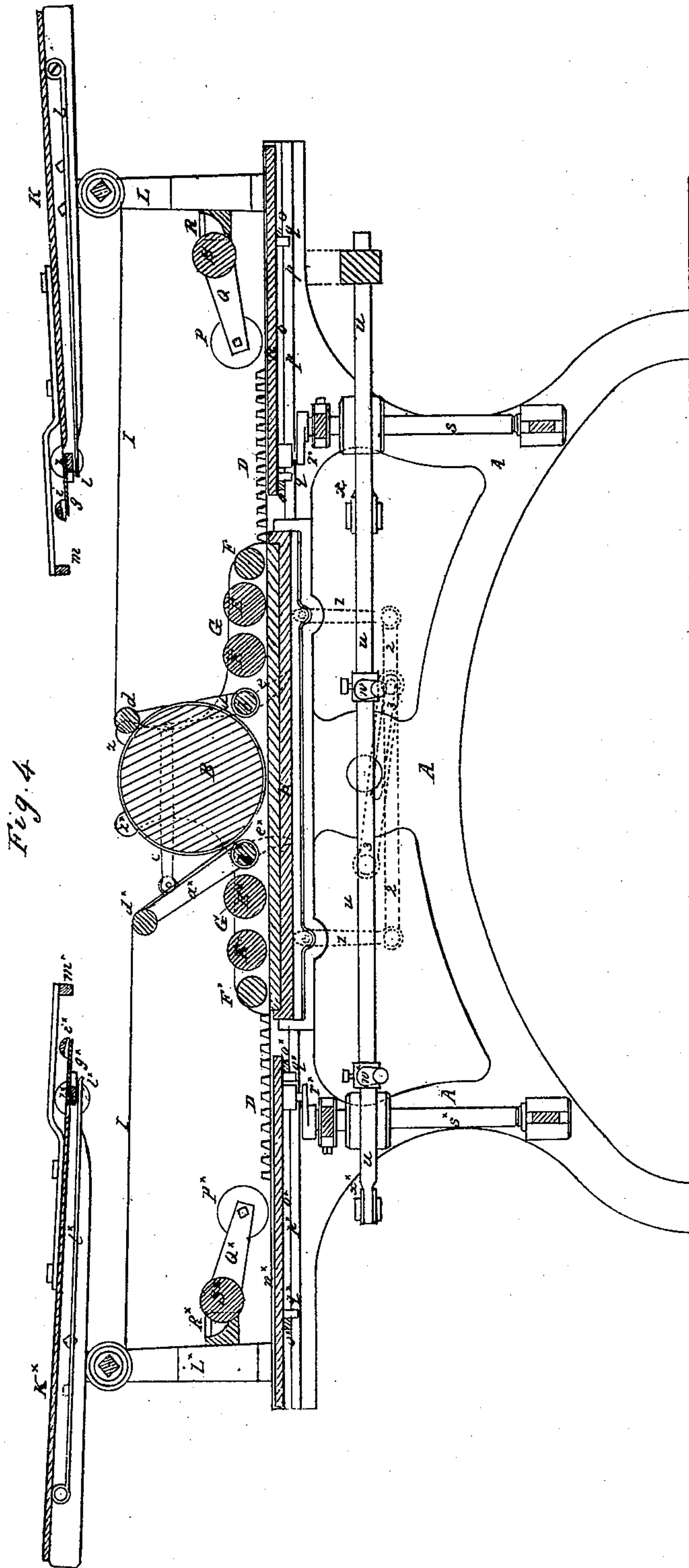


Fig. 4

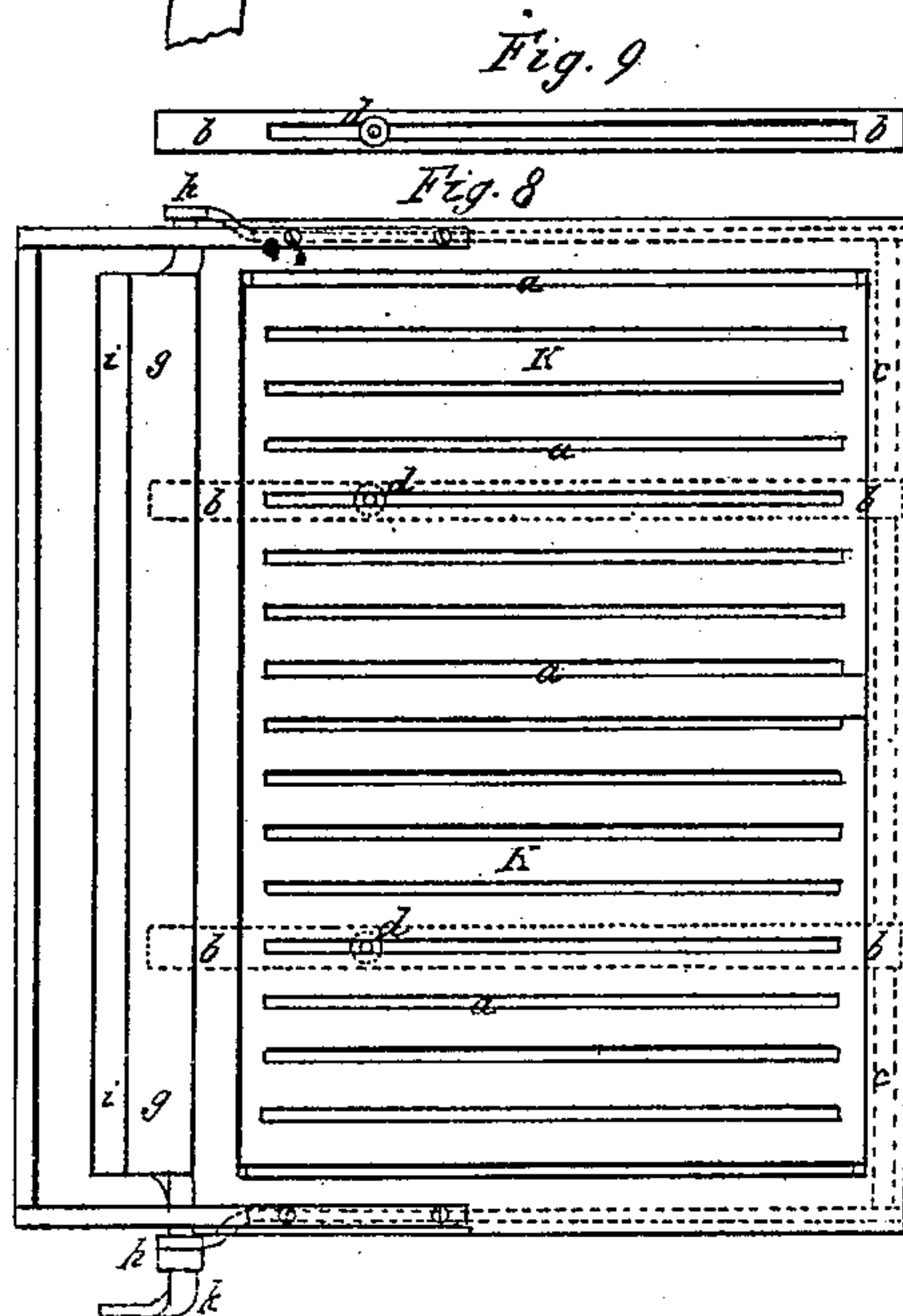
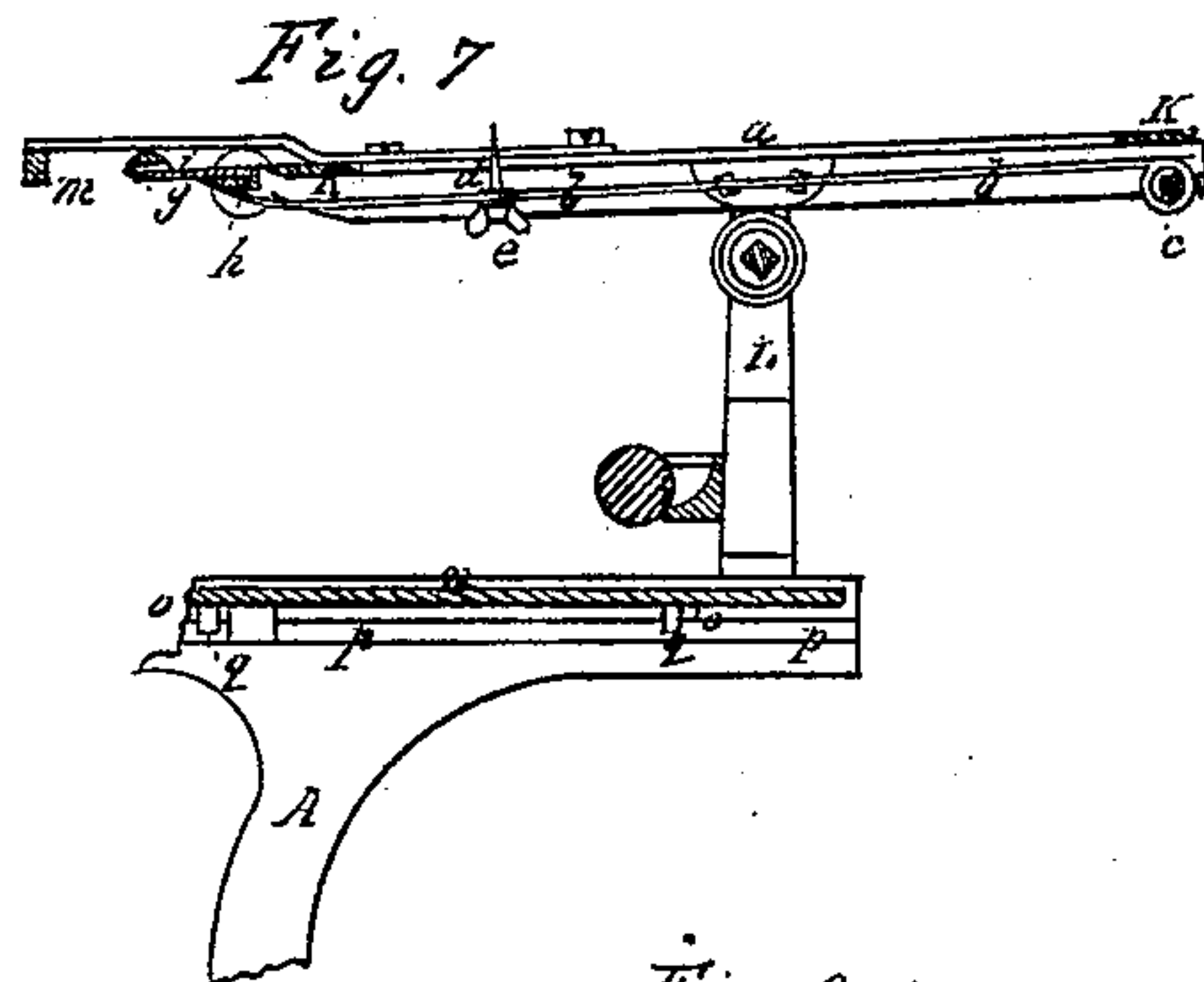
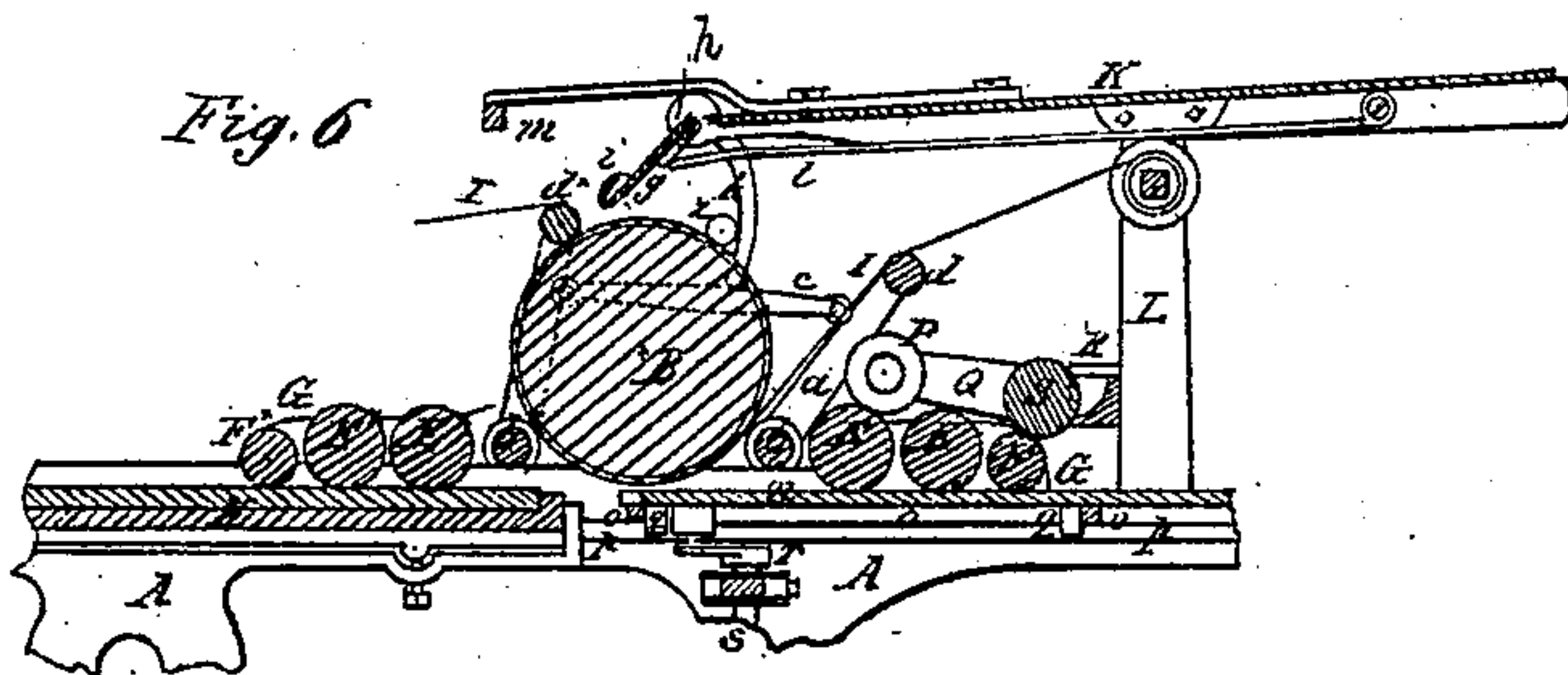
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UNITED STATES PATENT OFFICE.

CHARLES JOHN CARR AND ANDREW SMITH, OF BELPER, ENGLAND.

IMPROVEMENT IN LOCOMOTIVE CYLINDER PRINTING-PRESSES.

Specification forming part of Letters Patent No. 1,775, dated September 10, 1840.

To all whom it may concern:

Be it known that we, CHARLES JOHN CARR and ANDREW SMITH, engineers, both of Belper, in the county of Derby and Kingdom of England, subjects of the Queen of Great Britain, have invented or discovered a new and useful invention of certain Improvements in Printing-Machines; and we do hereby declare that the following is a full and exact description thereof.

This invention of improvements in printing-machines applies to that kind or description of letter-press or type printing-machines in which the impression is obtained from the forms of type onto the sheets of paper by traveling or locomotive printing-cylinders as they pass or roll over the forms of type in their passage from one end of the machine to the other, the forms of type being placed on fixed tables; and it consists in certain novel features, additions to, or improvements on or in such printing-machines.

These novel features consist, first, in the arrangement and construction of those parts of the machine used for receiving the sheets of paper from the delivering-tables and giving them to the printing-cylinder and guide tapes or bands, to be conducted through the machine and printed upon, and afterward delivering the printed sheets from the machine, the guide-tapes and printing-cylinder forming no part of these improvements; secondly, in an improved apparatus for distributing the ink taken from the inking-troughs and ductor-rollers and passing it onto the inking-rollers to be conveyed to and spread over the form of type from which the impression is intended to be taken; thirdly, in the arrangement and construction of certain parts suitable for effecting a register, as on books or such other work where it may be found necessary or desirable; and in order that our invention may be the better understood we have appended several drawings and a description of one modification of the above class of machines with our improvements applied thereto, and shall describe the operation of such machine in conjunction with the operations of our improved or additional parts thereon.

Figure 1 is a side view; Fig. 2, a plan view; Fig. 3, a transverse section taken on the line *a b*, Fig. 1; and Fig. 4 is a longitudinal section.

A A is the frame-work of the machine, upon the upper part of which the printing-cylinder B travels, it being guided in its motion by a V-shaped strip $a^2 a^2$ along the bed on the top of one of the side frames and a correspondingly shaped groove a^3 , formed round one end of the cylinder, as shown in Fig. 2. Upon the ends of the cylinder toothed wheels or rims C C are placed, which take into toothed racks D D on the top part of the frame-work.

E E* are the several inking-rollers to give the proper supply of ink to the form of type and F F* the distributing-rollers, all of which are mounted in the traversing frame G G, said frame being suspended from the axle of the printing-cylinder B. This frame causes these rollers to travel over the distributing-beds and forms of type as the printing-cylinder moves forward and backward. The frame G is kept in its proper position by means of small rollers $a^4 a^4$, Fig. 1, affixed to it, running against the under side of the toothed rack D.

H, Figs. 3 and 4, is the table upon which the form of type is placed, and is adjustable by means of screws or in any other convenient manner.

I I are the guide-tapes which conduct the sheets of paper to the cylinder and under it to be printed upon and afterward deliver it from the machine, which tapes or bands pass over the receiving-rollers hereinafter mentioned and round under the printing-cylinder, their ends being affixed to rollers mounted upon cross-rods affixed to the framing which carries the delivering-table.

K K* are two stationary delivery-tables, which are placed at each end of the machine, and are supported on arms L L*, extending from the adjustable pieces M M*, Fig. 1, which slide in dovetailed grooves N N* in the side frames A A, so as to allow the tables to be brought nearer to or farther from each other, as the extent of traveling motion in the printing-cylinder is required to be increased or diminished, according to the size of the sheet of paper to be printed upon, and may be fixed in their proper position by means of screws or otherwise; or the delivering-tables may be made adjustable in any other convenient manner.

O is the winch-handle by which the rotatory motion is given to the cylinder and by which

it is caused to travel along the machine, the toothed wheel *C C* taking into the racks *D D*, affixed to the side frames of the machine; or the cylinder may be moved backward and forward without this winch by a handle projecting from the sliding frame *G G*, by which the person attending the machine can push or pull the frame, and with it the printing-cylinder, forward and backward, the racks and wheels giving it the required rotatory motion.

Having now described the general features of the machine to which our improvements are applied, we proceed to describe the first portion of our invention, viz: the arrangement and construction of mechanism by which we effect the transferring of the sheets of paper to be printed upon from the delivering-table to the conducting-tapes, which convey them round under the printing-cylinder passing over the form of type.

*a a** are two levers connected by rods *c c* and turning on bars *b b**, mounted in the sliding frame *G G*.

*d d** are two rollers mounted upon the upper ends of the levers *a a**, around which rollers the tapes for conducting the paper to be printed upon pass.

*e e** are two tail-pieces forming the lower ends of the vibrating levers *a a**, which, as the cylinder travels backward and forward in the machine, come alternately in contact with their respective stop-pieces *f f**, affixed to the adjustable sliding pieces *M M** of the delivering-tables *K K**.

*g g** are leaves or lips, of metal or wood, forming a continuation of the delivering-table *K K**, and turn on centers in the framework *L L** at *h h**.

*l l**, Fig. 4, are springs for keeping them elevated when receiving their supply of paper.

*i i** are strips of wood acting as guides affixed to the upper sides of the lips or leaves *g g** and are hollowed out on their under side, leaving a channel for the passage of the sheet of paper to be printed upon.

*k k** are curved tail-pieces attached to the axis of the lips or leaves *g g**, against which the tappets *z z**, affixed to the sliding frame *G G*, strike when the frame and printing-cylinder move to the one or other end of the machine.

*m m** are adjustable gages or stops connected with the delivering-table and projecting beyond the lips or leaves *g g**.

The distributing-table and its appurtenances, constituting the second feature of our present invention, is seen best at Figs. 3, 4, and 5, this last being a detached plan view of the same shown in connection with a portion of the machine.

*n n** are the distributing-tables resting upon sliding frames *o o o* o* o**, which are allowed to move lengthwise of the machine upon the stationary ledges *p p* and *p* p** of the frame-work of the machine.

q q q q q q* q* q** are pins affixed to the

under side of the distributing-table, acting against the inner edges of the sliding framework *o o o o* o* o**.

*r r** are cranks, the pins of which take into the distributing-tables *n n**. These cranks are mounted upon the upright shafts *s s**, turning in suitable bearings, and carry upon them the ratchet-wheels *t t**. (Seen in Fig. 3.)

u u is a rod which has an alternating motion given to it by means of the tappet *v*, mounted on the movable frame *G*, striking against the adjustable stop-pieces *w w**.

x x are levers mounted and turning loosely upon the crank-shafts *s s**, and are connected at their ends to the alternating-rod *u u*, which levers carry the clicks or pawls *y y**, Fig. 3, taking into and driving the ratchet-wheels *t t**.

The action of the whole is as follows: The person attending the machine turns the winch-handle round (say in the direction of the black arrow, Figs. 1 and 4) until the printing-cylinder has arrived very near one of the delivering-tables. The receiving-roller *d* will then be in the position shown best in Figs. 1 and 4—that is, with the tapes or bands pressed by it against the printing-cylinder. The sheet of paper to be printed upon has at this time been placed upon the delivering-table *K*, passed through the guide *i*, and its edge brought against the stationary gage or stop-piece *m*. On the cylinder continuing to move a little farther the tail-piece *e* of the lever *a* arrives in contact with the adjustable stop-piece *f*, by which means the receiving-roller *d* is carried away from the printing-cylinder, which, by means of the connecting-rod *c*, brings the other receiving-roller *d** with it toward the cylinder. During this operation the tappet *z* on the movable frame *G* is brought against the tail-piece *k* of the lip *g*, by which means the sheet of paper is carried downward to the periphery of the printing-cylinder, and is there held by the further descent of the receiving-roller *d** and conducting-tapes *I I*, as shown in the detached view, Fig. 6. During these operations the tappet *v*, affixed to the movable frame *G*, has struck against the adjustable stop-piece *w*, and by so doing has forced the alternating rod *u* and lever *x* in the direction of its arrow, thereby turning the crank-shaft *s*, by means of the pawl *y* taking into the ratchet-wheel *t*, round a portion of a revolution, and with it the distributing-table *n n*, which, being propelled by the crank, has, by means of the pins *q q*, working in parallel guides of the slide-frame *o o*, a tendency to move in the direction of the arrow, Fig. 5, while the sliding frame *o o*, being free to recede, gives way to the pressure exerted against it and permits the table to move simultaneously at right angles to its other motion, thereby changing every point of contact between it and the distributing-roller *F*, which took place at the previous contact of the parts. The supply of ink to the distributing-roller *F* is given in the following manner: *R R**, Figs. 4, 5, and 6, are the ink-troughs, which are mounted upon the

frames L L*, and are consequently adjustable with them to suit a varied extent of motion in the machine in order to print upon sheets of paper of various sizes. P P* are anti-friction rollers mounted on pins affixed to arms Q Q*, which turn loosely upon the axles of the ductor-rollers S S*, on which axles are affixed ratchet-wheels acted upon by pawls affixed to the arms Q Q*, as shown at *a*⁵, Fig. 5. When the frame G moves to the one or other end of the machine—say in the direction of the black arrow—the anti-friction roller P will run up its inclined ends, and by so doing will raise the arm Q, and by means of the pawl taking into the ratchet on the axle of the ductor-roller will turn it round a portion of a revolution, and by so doing afford a fresh portion of its surface and supply of ink to the distributing-roller F. When the frame G is moved in the reverse direction, the arm Q, with its roller, will again fall, ready to be acted on in a similar manner on the return of the carriage. The parts then being situated as shown in Fig. 6—that is to say, the sheet of paper having been brought by means of the lip *g* and guide *i* down onto the cylinder and it being there held by the receiving-rod *d** and guide-tapes I I—the winch-handle is turned in the direction of the red arrow, Fig. 6, by which means the cylinder is made to revolve back again, carrying with it the sheet of paper and passing over the form of type on the table H, where it receives the required impression, which is produced by the weight of the frame G G and the cylinder as it rolls over the form of type, and as the cylinder continues to revolve toward the delivering-table K* at the left-hand end of the machine the sheet of paper now printed upon is carried or conducted out from the cylinder between the roller *d* and the printing-cylinder, from whence it is taken away by hand. At the same time the tail-piece *e** of the vibrating lever *a** meets with the stop-piece *f**, when the sheet of paper having been laid upon the delivering-table K*, as before described, it is embraced between the receiving-roller *d* and printing-cylinder B. The tappet *v* has also struck against the stop-piece *w**, thereby bringing it back into the position shown in Figs. 1 and 4 and shifting the distributing-table *n**, as before described with reference to the opposite side of the machine, the feed of ink for the next sheet to be printed upon being given by means of the roller P*, as at the other end of the machine, when, the winch-handle being turned again the reverse way, the sheet of paper is taken through the machine, printed upon as before, and delivered out at the right-hand end, and so on, the cylinder producing an impression at each forward and backward motion of the machine, receiving the sheets alternately on one side of the cylinder and delivering them at the other. Should any extraordinary pressure be required, the anti-friction rollers on the frames G G might be tightened upon

the under side of the racks D D, by which they would be made to hold down the cylinder upon the type, and thereby produce a greater pressure than is caused by the weight.

Should it be required to use this machine for printing singly or in only one way in which the cylinder revolves, the parts drawn in red in Fig. 4 show how we effect this. 1 1 are arms supporting the table which carries the form of type. These arms are connected together by the rod 2 2. 3 3 is a connecting-rod turning at one end on a pin affixed to the alternating bar *u u*, the other end embracing by means of a slot a stud affixed to the rod 2. In the position shown in the drawings, Fig. 4, the form of type is raised and the cylinder printing while traveling in the direction of the black arrow. As the frame G proceeds, the tappet *v* will, as before described, arrive in contact with the stop-piece *w*, thereby carrying the bar *u* along with it. By these means the end of the slot in the rod 3 will arrive in contact with the stud upon the rod 2 2, which will also be carried with it, turning the supporting-arms 1 1 upon their centers and allowing the form of type to fall down, permitting the cylinder to return without being in contact with the form of type, and in so returning the other end of the slot in the arm 3 3 will strike against the stud on the rod 2 and again bring the form of type into its elevated position, ready to give another impression.

Our third improvement—viz., the arrangement and construction of certain parts suitable for effecting a register for book or other work—is shown in the detached views, Figs. 7, 8, and 9, Fig. 7 being a transverse section taken vertically through a portion of one end of the machine with these improvements applied to its delivering-table, and Fig. 8 is a plan view of the same. K K is the delivering-table; *g*, the falling lip or leaf; *m m*, the adjustable gages or stops. It will be seen by reference to Fig. 8 that the delivering-table is in this instance provided with slots or gates *a a a*, extending in the direction of the length of the machine. *b b* are springs pressing at one end against the lip or leaf *g* and mounted at the other on the cross-bar *c*, and are capable of being moved to and fro thereon and fastened in any required situation by means of screws or otherwise. *d d* are the register-pins, which are mounted upon the springs *b b*. These pins move in slots formed lengthwise in the springs, as shown in the detached plan view, Fig. 9, so that, together with this last adjustment and that which they are capable of receiving by means of the spring moving on the bar *c*, can be arranged in any required position forward or backward or to the right or left that the slots *a a* will permit. The tables are made with sliding panels, so as to move sidewise should it be required to fix the points *d d* in any situation between the slots *a a*.

The operation of the parts is as follows: The points or pins *d d* having been removed from the springs *b b* by unscrewing the nuts *e e*, by which they are fastened thereto, the form of type is to be provided with points placed in any convenient position, as in the ordinary mode of working in register, and one side of the paper intended to be printed upon worked off by the operation of the machine, as before described, by which means the points in the form of type will be forced through the sheets of paper, leaving holes therein, as is well understood by all printers. The whole of the required quantity of paper having been printed upon on the one side, the form of type is to be changed in the ordinary manner and the points or register-pins *d d* affixed to the spring *b b*, as shown in Figs. 7, 8, and 9. The sheets of paper now to be printed upon the other side are placed upon the delivering-table *K K*, with the points or pins *d d* projecting through the holes formed by the points of the form of type used for printing the first side, the points or pins *d d* being adjusted in their proper position to insure the correct register by means of the slots formed in the table *K* and springs *b b*. The parts being in the position shown in Figs. 7 and 8, with the sheet of paper laid upon the delivering-table, as already described, the lip or leaf *g* will on the printing-cylinder advancing toward the right hand be depressed and carry with it the sheet of paper onto the periphery of the printing-cylinder, to be embraced by the receiving-roller *d**, as described with reference to the general operation of the machine, and in so doing will carry with it the springs *b b*, and consequently the points or pins *d d*, thereby liberating the sheet of paper to be carried

round the cylinder and over the form of type to be printed upon, as already explained.

The parts of novelty which we claim as secured to us are—

1. The arrangement and construction of those parts of the machine used for receiving the paper from the delivery table or tables and giving them to the printing-cylinder and guide tapes or bands to be conducted through the machine and printed upon and afterward delivering the printed sheets from the machine, said arrangement and construction consisting principally of the falling leaf *g* and stop *m*, in combination with the receiving-roller *d*, the whole being constructed and operating as set forth.

2. The improved apparatus, as above described, for distributing the ink taken from the inking-troughs and ductor-rollers, said apparatus consisting of the ratchet *a*⁵ on the ductor-rollers and their appurtenances, arranged and operating as herein set forth.

3. The arrangement and construction of the parts above described for effecting a register, as in book or other work where such register may be required, said arrangement consisting of the combination of the springs *b b* with the falling leaf *g* for liberating the paper from the register-points.

In witness whereof we, CHARLES JOHN CARR and ANDREW SMITH, have hereunto set our hands and seals this 18th day of October, 1839.

CHARLES JOHN CARR. [L. S.]
ANDREW SMITH. [L. S.]

Witnesses:

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WM. TUDOR MABLEY,
Clerks to Newton Berry.