(No Model.)

2 Sheets—Sheet 1.

M. H. DEMENT.

TYPE WRITING AND TYPE MATRIX MAKING MACHINE.

No. 302,653. Patented July 29, 1884.

Fig. 1.

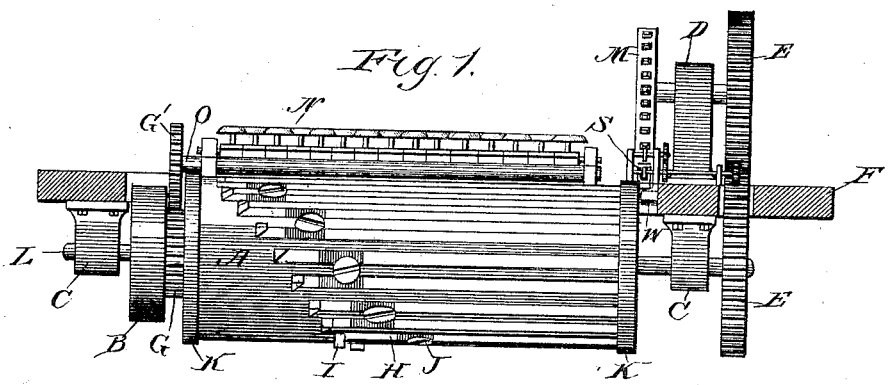


Fig. 2.

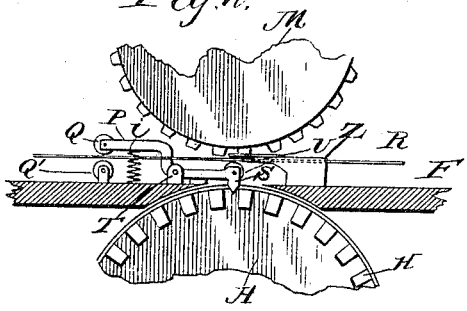
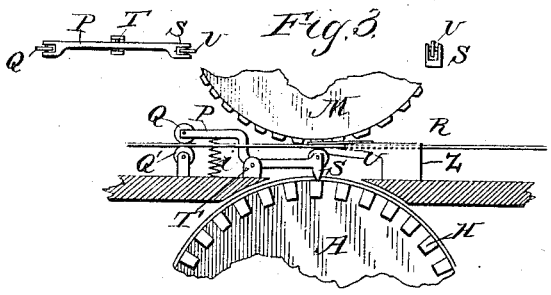


Fig. 3.



Witnesses.
Will R. Quohundro.
T. E. Wood,

Inventor
Merritt H. Dement

(No Model.)

2 Sheets—Sheet 2.

M. H. DEMENT.

TYPE WRITING AND TYPE MATRIX MAKING MACHINE.

No. 302,653. Patented July 29, 1884.

Fig. 4.

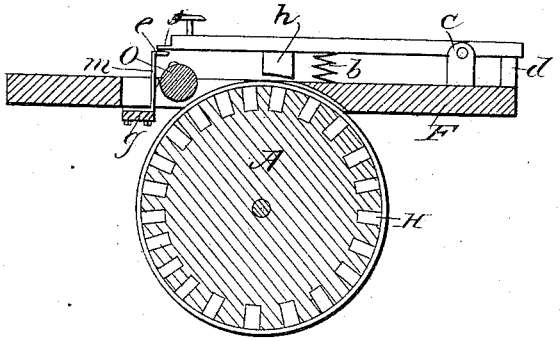


Fig. 5.

Fig. 6.

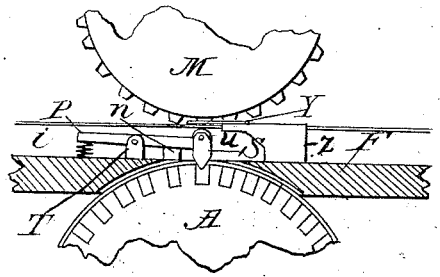
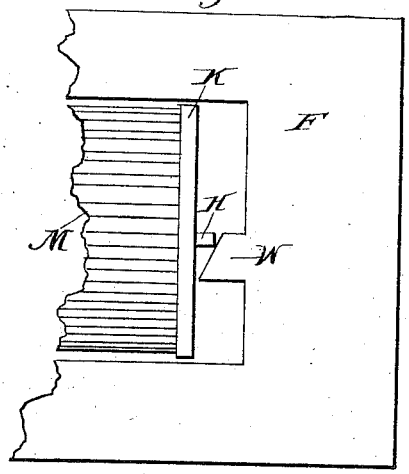


Fig. 7.



Witnesses.
Will R. Ouchmidt.
P. C. Wood

Inventor.
Merritt H. Dement

UNITED STATES PATENT OFFICE.

MERRITT H. DEMENT, OF CHICAGO, ILLINOIS.

TYPE-WRITING AND TYPE-MATRIX-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 302,653, dated July 29, 1884.

Application filed December 8, 1883. (No model.)

To all whom it may concern:

Be it known that I, MERRITT H. DEMENT, of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Type-Writing and Type-Matrix-Making Machines, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, which form a part hereof.

My invention relates to the art of printing; and it consists of a machine for making type-matrices in or printing with ink upon paper, papier-maché, or other suitable substance, as hereinafter set forth, and specifically pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a front elevation of the machine, the base-plate being shown in section. Fig. 2 is an end view of a portion of type ring and cylinder, showing printing mechanism. Fig. 3 contains a similar view showing printing-lever in printing position, and also detail views of lever. Fig. 4 is a sectional view showing action of keys and springs *m* and cam-cylinder O. Fig. 5 shows side and end views of cylinder O. Fig. 6 is a view of modification of my machine without the milled wheels. Fig. 7 is a view at printing end of cylinder A with type-ring removed, showing cam W, for returning rods to cylinder after operating.

More particularly described, the machine consists of a revolving cylinder, A, type-wheel M, and series of rods H, and a series of keys, N, by means of which the rods are operated. The cylinder A is placed upon a suitable shaft, L, running in hangers C C, secured to a table or base-plate, F, with a pulley, B, at one end, by means of which power may be applied. Any desired number of longitudinal grooves are cut in the cylinder, in which are placed bars or rods H, secured in place by means of screws J at one end, and a band, K, at the other, and adapted to slide in the grooves when operated upon by the cams *h* on the key-bars N, so that their ends will protrude from the end of the cylinder. Upon a separate shaft running in standard D, and above the end of the cylinder, is placed the type-ring M, its shaft being connected with the shaft of the cylinder by means of gear-wheels E E, so arranged that the type wheel and cylinder will revolve in unison. Each rod is provided with a cam-pin, I, which protrudes from the surface of the cylinder at such a point longitudinally upon the rod that as the cylinder revolves it will come in contact with the cam *h* upon the corresponding key-bar N.

A key-board, consisting of the same number of keys as there are rods, is placed above the cylinder. The key-bars are pivoted at their inner ends upon the rod *c*, and are held up from contact with the cylinder by means of the spring *b*, the plate *d* serving to prevent the key-bar from being thrown too far upward by said spring. These key-bars are provided with cams *h*, adapted to come in contact with the cam-pins I upon the rods when the key-bars shall have been depressed, each cam *h* operating upon the cam I of a particular rod in the cylinder. In order that the key-bars may be depressed at such a time as that the cam on the first bar, which would ordinarily be designated by the letter A, would come in contact with the cam-pin upon the first rod in the cylinder, which would ordinarily operate upon the letter A in the type-ring, and in order that any key which shall be depressed at that time may be held down until it shall have operated, a series of spring-stops, *m m*, are provided and secured to the under side of the base-plate F by means of the bar G, their upper ends extending upward through the base-plate, and being provided with arms *e*, which extend under the tongues *f* on the key-bars, and thus operate to hold the key-bars up in position and away from the cylinder, so that the cams *h* will be out of line of contact with the cams I upon the rods. At the proper point in the revolution of the cylinder these spring-stops are required to be thrown backward, so as to leave the key-bars free to be pressed downward to operating position, when the stops are required to react, so that the arm *e* will pass above the tongue *f*, and thus operate to hold the key-bar in position until the spring-stop *m* shall, at the next revolution of the cylinder O, be again thrown back, at which point the key will be lifted to resting position again by the spring *b*. To operate these spring-stops *m*, I provide the small cylinder O, which is geared, by means of gear-wheels G and G′, to run in unison with the cylinder A, and

upon this cylinder O is placed a longitudinal cam, *a*, which, as the cylinder O revolves, comes in contact with the spring-stops *m*, which at the point of contact are each provided with a small prominence or cam, and presses the spring-stops back, so as to leave the manuals or key-bars free to be depressed by the operator into operating position, or to rise to their resting position after operating, as the case may be. This cam *a* is formed on the cylinder O with a slight curve or twist, in order that the end which operates upon the spring-stops for the last manuals of the key-board will not reach those stops until such of those keys as shall have been depressed to the operating position at the preceding revolution shall have had full opportunity to operate upon their corresponding rods in the cylinder A.

The type-ring M is provided with a circumferential row of type set radially in the ring, and so arranged that each type will arrive at the printing-point simultaneously with the rod, which is operated by the corresponding key of the key-board, so that the rod which shall have been caused to slide in its groove by the action of the cam *h* upon the key, which shall be designated in the key by the letter A, shall arrive at the printing-point in conjunction with the type A in the type-ring.

Beneath the type-ring, and in a grooved plate, *z*, is placed a strip, R, of paper or papier-maché. The object to be accomplished now is to press the paper upon the type so as to cause type-matrices to be made therein, or type-forms to be printed thereon. This is accomplished by means of a lever, P, Fig. 6, pivoted to a support, T, and provided upon its inner end, which lies at the printing-point, with a cam, S, upon its lower surface, and with a small ring or wheel, U, journaled in its upper portion. The cam on the lower portion lies free from contact with the rods when they are at rest, but in the line of the rods as they are caused to protrude from the end of the cylinder. When a rod is operated upon by a key and caused to protrude, it will come in contact with the cam S on the lever P and press the cam on that end of the lever upward, so that the small wheel U will come in contact with the paper and press it upon the type. Where type-indentations are made in papier-maché, the types as they are embedded in the papier-maché will serve to pull or feed the paper, so as to give the matrix of the type which is being indented its proper space upon the strip. The different lengths of feed are produced by providing rods H of different widths, so that their operation will be to press the wheel upon the type for a long or a short time, according to the width of the letter. But where it is desired to print with ink upon the paper the type will not have a sufficient hold upon the paper to feed it properly, and it is necessary to provide other means for grasping and pulling the paper. This is provided, as is shown in Figs. 2 and 3, and consists of two milled rings, Q and Q′, between which the edge of the paper is grasped and pulled. The lower milled ring, Q′, runs in stationary bearings, while the upper wheel, Q, is arranged to run in bearings upon the outer arm of the lever P. These milled wheels are geared (not shown) to the cylinder or type-ring, and adapted to revolve at the same speed upon their faces as the faces of the type move. The upper milled ring, Q, is held away from the lower milled ring, Q′, when not operating, so as to permit the paper strip to lie between the two and free from contact therewith, by means of a spiral spring, *i*, under the outer arm of the lever P, which operates to throw the arm upward, the stop *n*, as in Fig. 6, serving to regulate the movement.

The operation in this form of the machine is substantially the same as before described, except that as the ends of the rods which are protruded come in contact with the cam S of the lever P, and press the wheel U on the type, the outer arm of the lever in which is secured the milled ring Q is pressed downward, so as to engage the paper strip and press it upon the lower milled ring, Q′, and cause it to be pulled or fed simultaneously with the making of the print-impression upon the strip, so that while the paper is being pressed upon the type it will be pulled the proper distance to give the letter that is being printed thereon its proper space.

To cause the paper strip to be thrown promptly from the type after printing, a forked spring, Y, is placed above the paper strip in such a position that when the paper is pressed upon the type the type will strike the paper between the forks and the spring, and when the pressure is removed the forks of the spring will operate to throw the paper promptly away from the type.

To return the rods to the cylinder after operating, a cam, W, is provided and secured to the base-plate in such a position that the protruding rod ends will strike it after operating and be pressed back into the cylinder to their resting position.

I do not limit myself to sliding rods, as I am aware that other rods may be used to accomplish the same object.

In this application I do not claim the combination of the rods, rotary holder, milled rings, and mechanism by which the wheels are caused to grasp and advance or pull the paper different distances, herein shown and described, as the same is claimed in my application No. 113,368, filed December 3, 1883; and in like manner I do not here claim the combination of the manuals and the spring-stops with the cam-cylinder O, revolving in unison with the cylinder A, as herein shown, the same being claimed in my application No. 133,570, filed June 2, 1884.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the lever P and a rotary holder with a series of rods, by means

of which the lever is pressed upon the material operated upon, substantially as shown and described.

2. The printing-lever P, provided with a wheel, S, in combination with a series of rods in a rotary holder, and the type-ring, substantially as and for the purposes shown and described.

3. The combination of a rotary holder and its series of rods of different widths, with the printing-lever P, and type-ring, substantially as shown and described.

4. A rotary holder and its series of rods, in combination with the printing-lever P and milled rings Q and Q′, substantially as and for the purposes shown and described.

MERRITT H. DEMENT.

Witnesses:
L. M. DALTON,
F. J. GRIDLEY.