

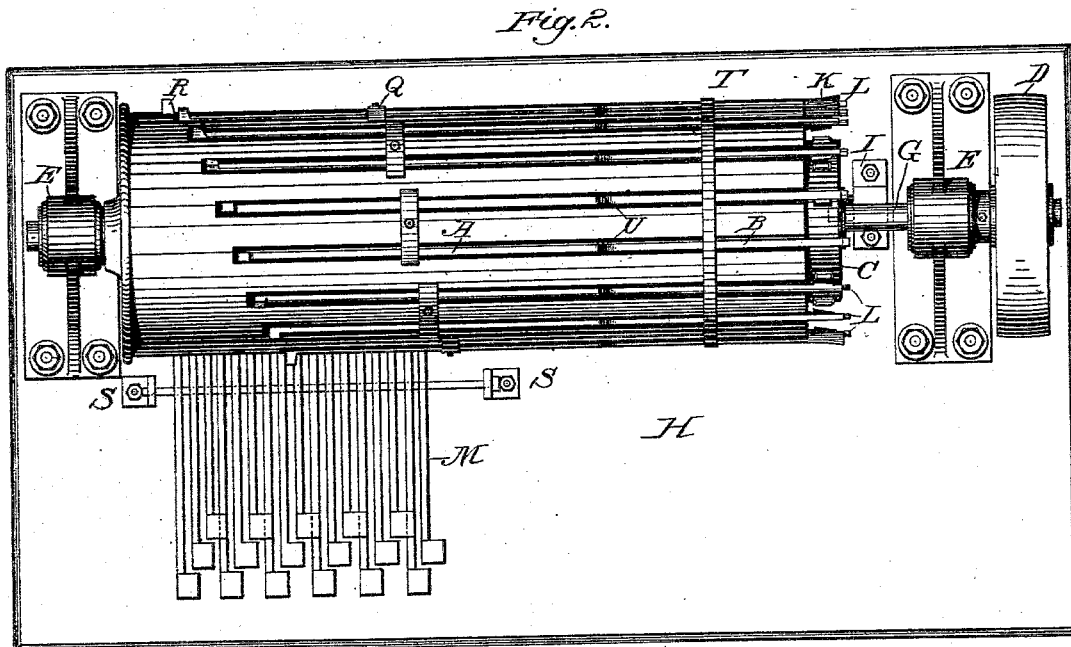
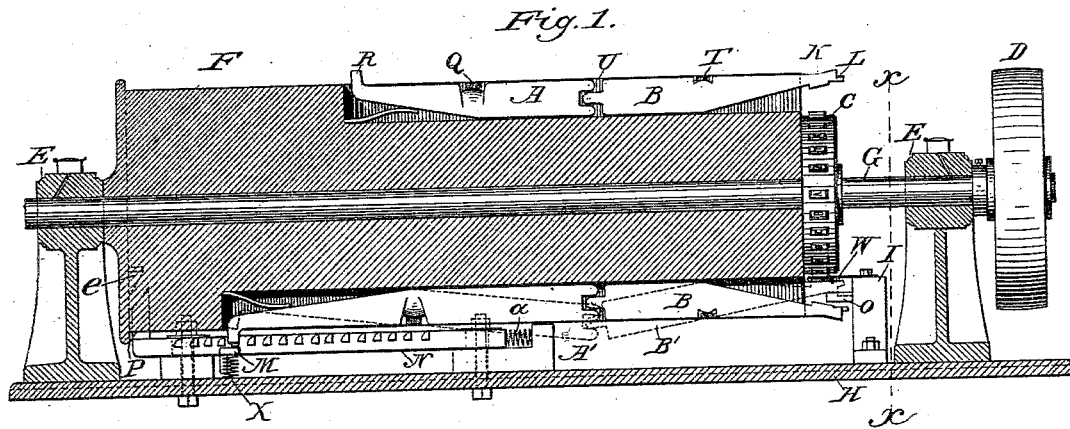
(No Model.)

3 Sheets—Sheet 1.

M. H. DEMENT.
TYPE WRITING MACHINE.

No. 301,486.

Patented July 8, 1884.



Witnesses.

Will C. Omohundro.
Frank S. Blanchard.

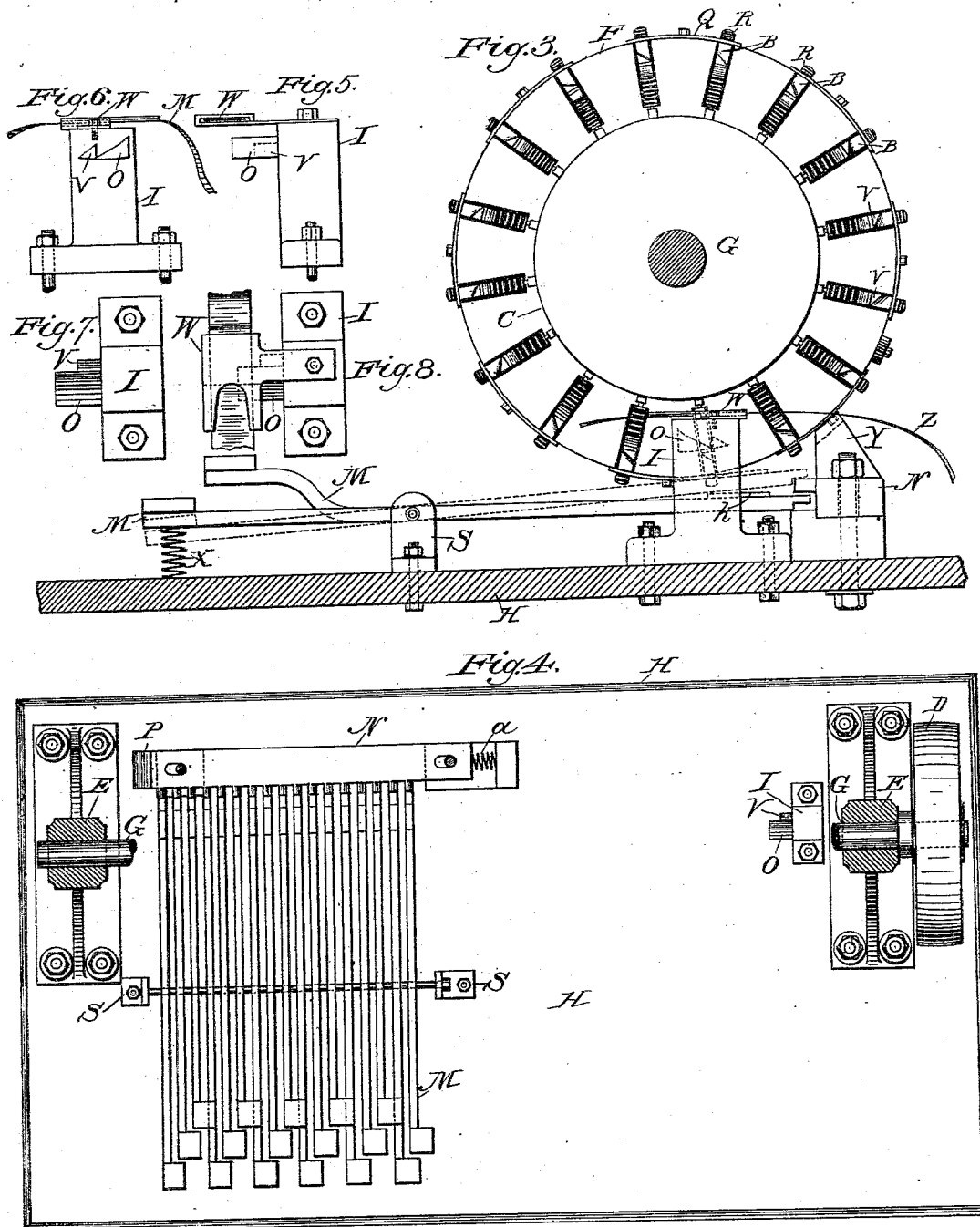
Inventor.

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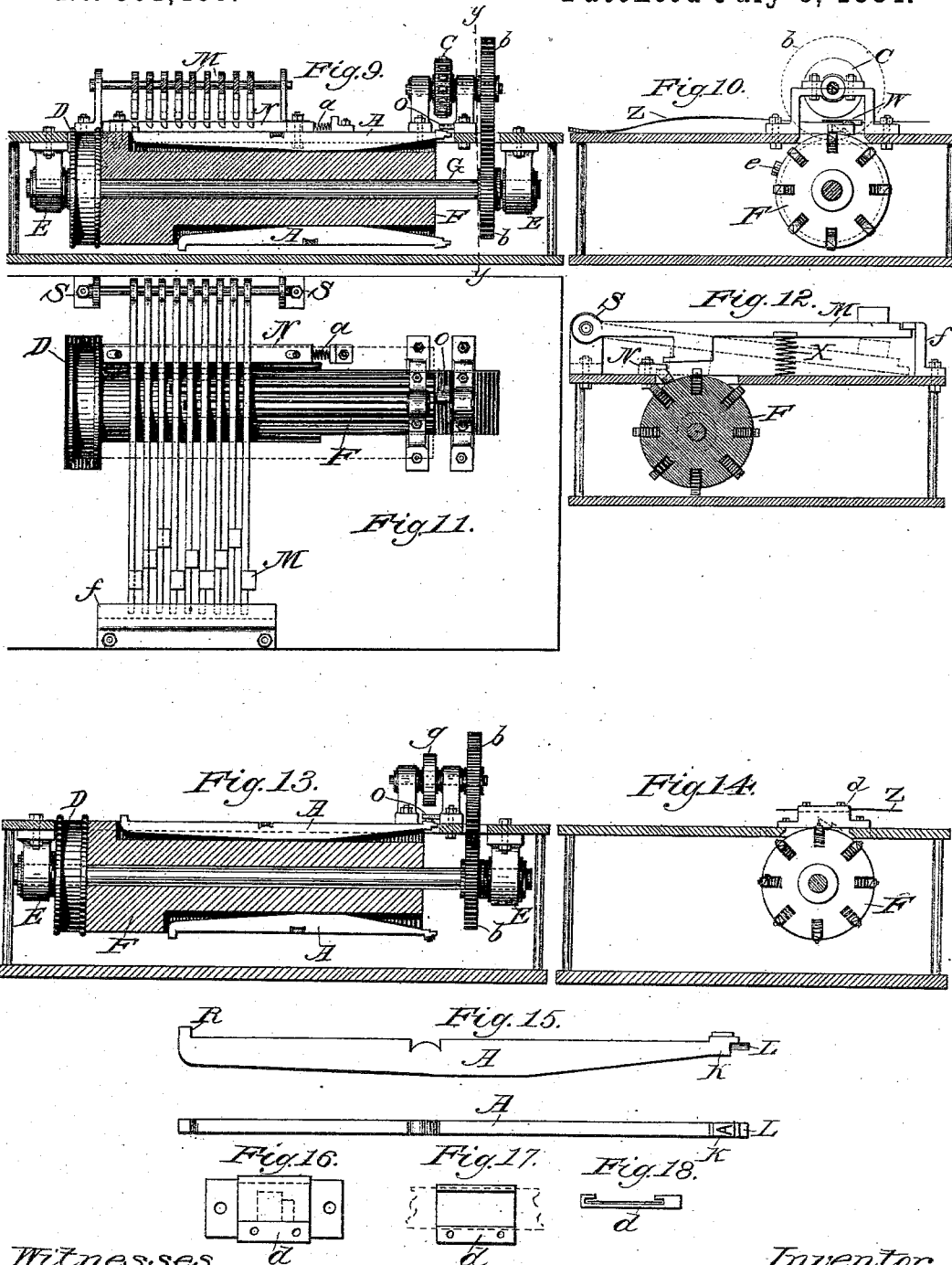
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UNITED STATES PATENT OFFICE.

MERRITT H. DEMENT, OF CHICAGO, ILLINOIS.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 301,486, dated July 8, 1884.

Application filed March 17, 1883. (No model.)

To all whom it may concern:

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

My invention relates to the art of printing; and it consists of a new and improved type-writing and printing machine, by means of which words, figures, symbols, &c., may be printed or indented upon or in strips or sheets of paper or other suitable material, as hereinafter described, and particularly pointed out in the claims. In a former application I have applied certain cam devices to a machine combining a revolving cylinder with a series of sliding rods. I desire now to use somewhat similar cam devices, in combination with a revolving cylinder and a series of pivoted tilting or tipping bars, and to make certain other useful improvements, which are hereinafter described and shown, whereby the machine is made easier to operate, less liable to get out of order, more accurate and certain in operation, and less expensive to manufacture.

In the annexed drawings, Figure 1 is a central longitudinal vertical section of my improved machine, the shaft, type-ring, and pulley being shown in elevation. Fig. 2 is a plan view. Fig. 3 is a transverse vertical section taken on line *x x*, Fig. 1. Fig. 4 is a plan view with cylinder and type-ring removed, showing cams and arrangement of key-bars, and toothed bar for holding key-bars against the cylinder while operating. Figs. 5, 6, 7, and 8 are detail views of the cams and paper-guide and support therefor. Fig. 9 is a central vertical section of a modification of my machine, showing type-ring upon a separate shaft, and tilting bars in one piece, instead of being jointed. Fig. 10 is a sectional view thereof on line *y y* of Fig. 9, the type-ring and upper gear-wheel being shown in outline. Fig. 11 is a plan view thereof with type-ring and gear-wheel removed, *f* representing a stop-plate, against which the spring *X* presses the bars *M*. Fig. 12 is a central vertical sec-

tion thereof, showing modified arrangement of key-bars and toothed bar. Fig. 13 is a longitudinal vertical section, substantially the same as Fig. 9, except showing plain backing-ring *g*, instead of a type-ring; the type being shown upon the tilting bars. *b b* represent gear-wheels. Fig. 14 is a sectional view showing manner of attachment of backing-plate and paper-guide *d*, of which Figs. 16, 17, and 18 are detail views. Fig. 15 are detail views of tilting bars with type attached.

In constructing the improved machine, the cylinder *F* is placed upon a shaft, which rests in bearings or hangers *E E*, secured to a base-plate, *H*, which should be of cast-iron. Power is applied by means of a pulley, *D*, at the end of the shaft *G*. A type wheel or ring, *C*, somewhat smaller in diameter than the cylinder, with the letters of the alphabet, capitals, and small letters, figures, punctuation-marks, &c., set radially therein, is placed on the shaft *G* and next to the end of the cylinder. A series of longitudinal grooves are cut in the cylinder, in which are placed a series of bars, *A*, corresponding in number with the type in the wheel or ring, and pivoted at or near their centers, and cut sloping at the inner end, so that that end may be depressed in the groove, and the other end thereby lifted or tipped up. These bars are of different lengths, being placed evenly at one end and the other or inner end of each bar reaching to a particular key in the key-board. The bars are held in place by any suitable device, the one shown being the plate *Q*, secured to the cylinder by a screw, each end resting upon a bar at or near its center, so that one plate secures two bars. In the groove underneath each bar is placed a spring to hold it in position when not printing, and to throw the other end or hammer *B* from the paper after printing.

In the grooves at the end of the cylinder at which the type-ring is placed are a series of short bars or hammers, *B*, of uniform length, held in position by a band, *T*, which encircles the cylinder at about their centers. These hammers are loosely connected with the longer bars by means of tongues on one fitting in slots in the other. These hammers *B* are so arranged that they protrude a short distance from the

end of the cylinder and overhang the type-ring C, each hammer covering and operating upon a particular type. B' and A' represent outlines of bar and hammer while printing.

5 In a full-sized machine the ends of the hammers will protrude much less proportionately than as shown in the drawings, one-eighth of an inch being sufficient, and in the form of the machine shown in Figs. 1 to 8 the paper

10 strip as it is fed to and discharged from the printing-point should be held out of the way of the hammer ends as they revolve. This may be done in a variety of ways—for instance, by a guard at each side of the machine or

15 slightly twisting the strip. I do not in this application show or claim any device for accomplishing this result. In the form of the machine shown in Fig. 9 the paper strip will not be in the way of the hammers.

20 Upon the support I, secured to the base-plate H, are fixed a grooved plate, W, through which the paper strip to be printed upon is run, and two cams, O and V, the first cam, V, operating to bring the bars in position to pass

25 upon the second cam, O, and the second operating to press the bars upon the paper strip. These cams protrude or hang out from their support into the space between the protruding hammers and the type-ring, the hammers,

30 when at rest as the cylinder revolves, passing beneath the cams, and when operated upon by the keys M passing above the cams, and between them and the paper-groove W, which is next to the type-ring.

35 Z represents the paper strip passing through the plate W. The key-board is placed at the side of the cylinder, and consists of a series of bars, M, pivoted on a rod resting in supports S S, and corresponding in number with

40 the longitudinal bars in the cylinder, each with a lettered finger-plate on one end, and upon the other end, which reaches under the cylinder, a cam, h. By pressing upon the finger end of the bar the cam h is brought against

45 the cylinder and in the line of the cam-pin R upon the corresponding cylinder-bar, and as the cylinder revolves the cam-pin R will strike the cam h on the key-bar and be pressed inwardly by it.

50 To hold the cams on the key-bars rigidly against the cylinder while the cam-pins are pressing against them, I provide a mechanism consisting of a bar, N, placed under and parallel with the cylinder and back of the key-

55 bars, resting on suitable supports and capable of a slight movement endwise by means of screws moving in slots. This movement is caused by a cam, e, fixed on the surface of the cylinder, which at each revolution of the wheel

60 operates upon a cam, P, on the arm Y, at the end of the bar, causing the movement endwise, the bar being returned to its resting position by a spring, a, the slots preventing the spring from pushing the bar too far. The endwise movement should be about one-eighth of an inch.

65 This bar is provided with a series of teeth,

one for each corresponding key-bar. The end of each key-bar, when the bar is at rest, lies under a tooth in this bar; but as the cylinder revolves, and the cam e strikes the end of the bar N, it moves the tooth from over the end 70 of the key-bar, and brings over the end of the key-bar, instead, the open space in the toothed bar between the teeth, so that, if a key-bar be pressed upon at that instant, its end will pass 75 up through the opening between the teeth in the bar, and the bar being immediately returned to its resting position the tooth will pass under the end of the key-bar and hold the key-bar up in position until the next revolution of the cylinder, when the cam e will 80 throw the teeth of the bar back again, bringing the open space between the teeth under the end of the key-bar, thus leaving it free to fall again, through the action of the spring X, 85 which is placed under the finger end of the key-bar, to its resting position. The cam e on the cylinder is so placed that it operates on the toothed bar N immediately before the first pivoted bar in the cylinder shall, in the revolution of the cylinder, reach the cam h on the 90 key-bars, so that the first key of the key-board may be depressed in time to print in that revolution. It will be seen that if but the cam O were used, and the key should not act to 95 fully depress the bar, the bar might strike broadside the point of the cam O and stop the cylinder or break the bar or cam. This difficulty is prevented by cutting away the bar at the point L for a sixteenth of an inch, or there- 100 about, from the end, so as to form a thin cam on the inner edge, and placing the cam V immediately before and at the side of the cam O, the two cams L and V being made sharp, so that a very slight depression of the bars will 105 cause the cam L on the bar to catch above the cam V, which cam should be provided with sufficient rise to lift the bar to the proper height to be in position for the cam O.

The operation is as follows: By depressing 110 a key as the cylinder revolves, the cam R on the inner end of a bar is depressed in its groove. In turn the joint U is lifted, and the end of the bar which protrudes from the cylinder is depressed nearer the type-wheel. The cam L 115 upon the end of the bar strikes the cam V, which lifts the bar so that it will strike and ride upon the cam O, and as it rides thereon will be further depressed until it strikes the paper and raises the paper to the type. 120 At this point the second cam, O, is formed with a sharp bevel, and as the cylinder revolves and the bar has pressed the paper up to the type, the bar, coming in contact with this sharp bevel of the cam O, is given a more 125 direct stroke upward and drives the paper on the type with a direct hammer-like blow. The printing is thus accomplished.

The object of giving the sharp bevel to the upper part of the second cam, or, more properly speaking, giving very little rise to the 130 first part of the cam, is to prevent the bar from

catching the paper too soon, and thus probably dragging it too far.

To give each letter, as it is printed upon the strip, its proper space according to its width, the bars at the point K, where they pass over the cam O, are made of different widths. It will be seen that a wide bar will be longer in passing the cam than a narrow one. It will also be seen that as the bar presses the paper on the type, and the type is embedded therein, the paper strip will be pulled as long as the type is thus embedded, so that a wide bar will pull the paper farther than a narrow bar. This feature of the bars I have described in a former application, and make no claim for here.

The machine may be differently constructed by placing the type-ring upon a separate shaft, as in Fig. 9, in which case the pivoted bars are made in one piece, the printing-cams being placed outside of the bar ends, which protrude from the cylinder, the paper-groove being above the cams and between them and the type-ring. The action in this case is that by the operation of the key the inner end of the bar is depressed, and the end which protrudes from the cylinder is lifted, so that it strikes the cam, and is still further lifted until it strikes the paper and prints, in substantially the same manner as hereinbefore described; or the type-ring may be dispensed with and a plain ring used instead, as in Fig. 13, which may be concentric or on a separate shaft. In this case the type are cut or set in the bars on either their inner or outer edges, as the case may be, and the indentation is made by the bars passing over the cam and pressing the paper against the plain ring, which offers the necessary resistance to permit the type to be embedded in the paper. Two or more types may be cut or set in each bar, in which case the plain ring should be made to shift on its shaft, so as to cover the different types as they are to be printed from.

A still simpler mode of constructing the machine is to have a fixed plate, as in Fig. 14, which shall serve as a back to the paper strip, instead of having a plain ring or type-ring. In this form of the machine the type are cut or set in the bars, either on their inner or outer sides or edges, as the case may be. The plate may be secured to the base-plate, the paper-groove being cut in its face. Immediately under it, and still outside of the bars, the cams O and V are placed. The operation in this case is that the keys throw the protruding ends of the bars outward, so that they strike the cams, and are pressed still farther outward, and print in substantially the same way as heretofore described. In this form the type are cut on the outer edge of the bars; but the plate and cam may be placed inside of the bar ends, and the bars made double and jointed, as hereinbefore described, the type being cut on the inner sides or edges of the bars, and substantially the same results be accomplished.

To make the spaces between the words without indenting the face of the paper where the type-ring is used, I place therein a blank plate in place of a type, and upon the inner or outer edge, as the case may be, of the corresponding bar are placed pins or points, the operation being that when the bar presses the paper upon the blank pin or type in the ring the pin or point on the bar will serve to indent the paper and hold and pull it the same as if the indentation had been made on the other side of the paper by the type. The same result may be accomplished where a plain ring is used, and the type are cut or set in bars by placing upon the ring, pins, or points, immediately under the bar which connects with the space-key, so that when the space-key shall have operated that bar shall press the paper against the pin or point on the plain ring and the paper be pulled the same as if a type-indentation had been made on the other side of the paper. Where the plate is used instead of the ring, it will be seen that the indentation cannot be made in the back of the strip. In such case the inner or outer edge of the bar, as the case may be, should be slightly milled or roughened. The milling should not be made so as to cut deeply into the paper, because the space-bar can be made wider, if necessary, so that a very slight hold will pull it the required distance.

The pivoted tilting or tipping bars in a cylinder-machine are superior to other kinds of bars, because they occasion less friction, and are free from liability to get out of order by the breaking of cam-pins, as the action upon them is very gentle, and they do not require much power to operate. Another and more important advantage is the fact that the keys may be placed very close together, each not necessarily occupying over one-eighth of an inch. This is because the operation of the key is simply to press the bar inwardly, and there need be but little cam-surface, whereas in the case of sliding rods the key-bar has sufficient cam-surface to slide the rod the distance that it is required to protrude from the cylinder—viz., about three-eighths of an inch. By the use of the pivoted bars a key-board consisting of sixty-four keys may be compressed into a space of eight inches, making it convenient and easy for the operator to reach any desired number of keys required to be operated at once, whereas a key-board on a sliding-rod machine, consisting of sixty-four keys, if each occupied three-eighths of an inch, would be twenty-four inches long. A further advantage consists in the fact that the cylinder is proportionately shorter—that is, in my improved machine it need be but eight inches long, while in the other it may be twenty-four inches long. If the bars are pivoted at their centers, there will be as much movement at the protruding end as there is at the end depressed by the key-bar. To save friction, the longitudinal bars may be pivoted back of their centers or toward

the key-bar, and this will give a correspondingly-greater movement to the end of the bar; or the hammers, which protrude over the type, may be pivoted farther back and the same result be accomplished.

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

1. In a printing or type-matrix machine, a cylinder provided with a series of longitudinal tilting bars, substantially as shown and described.

2. The combination of a cylinder with longitudinal tilting bars and means for actuating the bars, substantially as shown and described.

3. The combination of a cylinder with longitudinal tilting bars and the cam O, substantially as shown and described.

4. The combination of a revolving cylinder, with its pivoted tilting or tipping bars and type, with mechanism for actuating the bars and pressing them upon the paper or material

to be printed upon or indented, substantially as shown and described.

5. The combination of a revolving cylinder and bars with type cut or set therein, with a plain backing-ring, and mechanism for pressing the bars against the paper or material to be printed upon or indented, substantially as shown and described.

6. The combination of a revolving cylinder with double or jointed pivoted or tipping bars, and a cam by means of which the bars are pressed inwardly, substantially as shown and described.

7. The combination of a revolving cylinder and a series of pivoted or tipping bars having cam-surfaces L, with the cam V, substantially as and for the purposes shown and described.

MERRITT H. DEMENT.

Witnesses:

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