3 Sheets—Sheet 2.

C. T. MOORE.

TYPE WRITING-MACHINE.

No. 173,232. Patented Feb. 8, 1876.

Fig. 2.

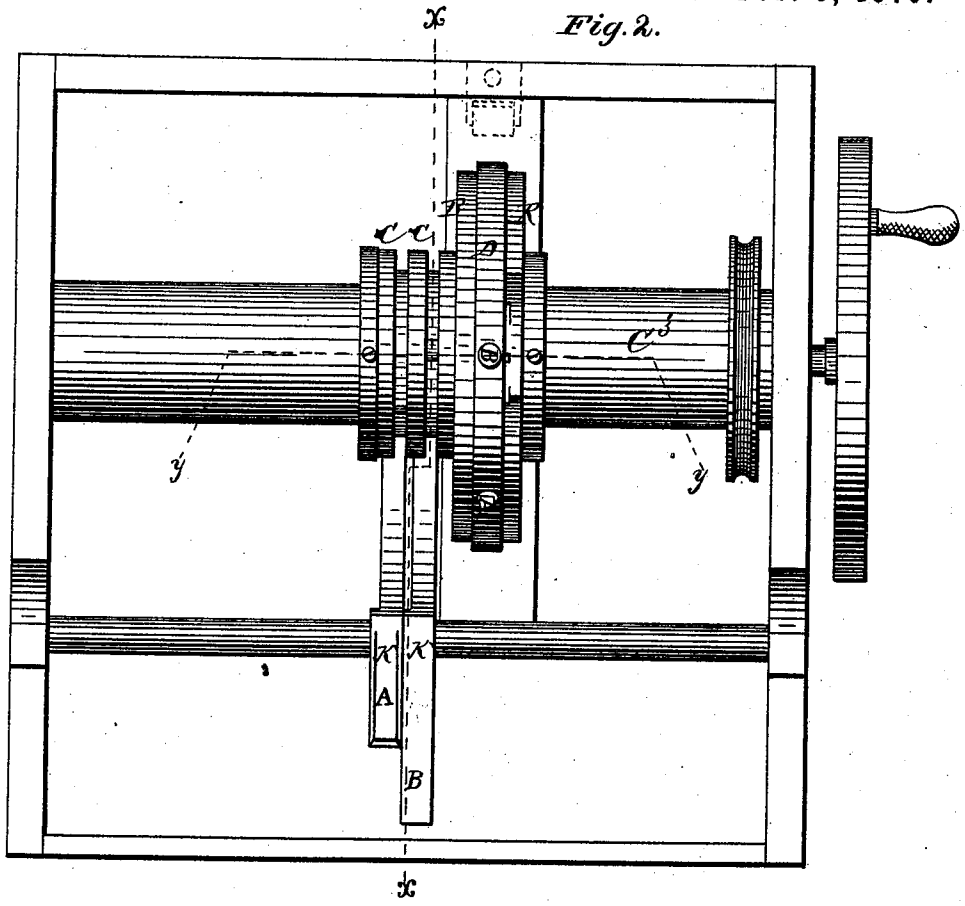
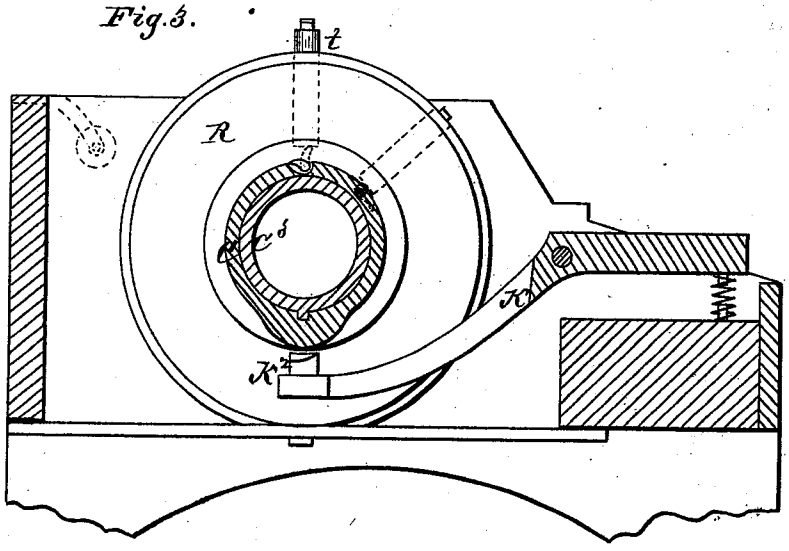


Fig. 3.



WITNESSES

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3 Sheets—Sheet 3.

C. T. MOORE.

TYPE WRITING-MACHINE.

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Fig. 4.

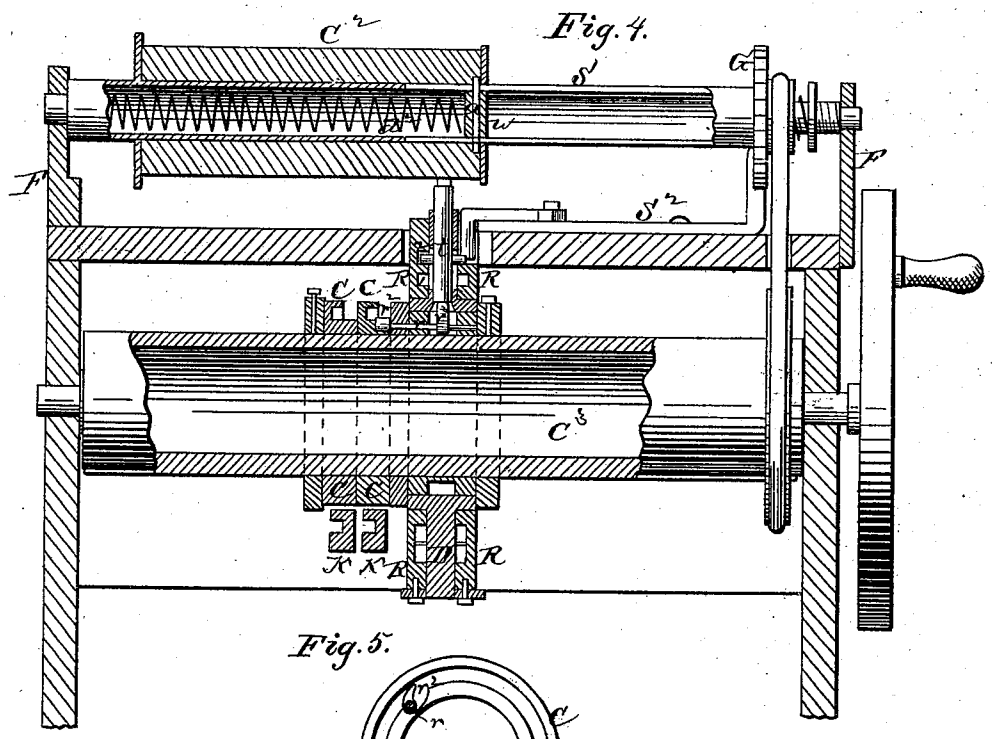


Fig. 5.

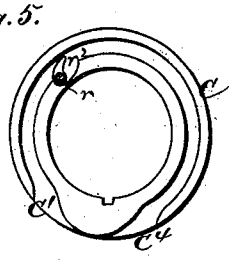


Fig. 6.

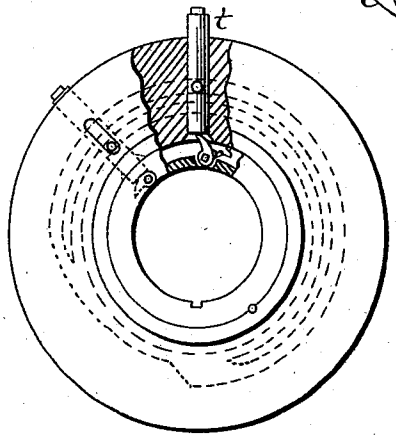


Fig. 7.

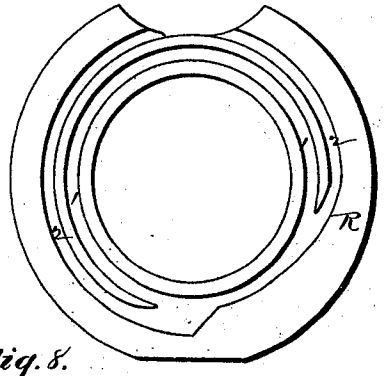
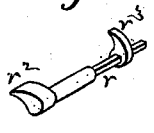


Fig. 8.



WITNESSES

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By

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Charles T. Moore
Alexander Mason

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UNITED STATES PATENT OFFICE.

CHARLES T. MOORE, OF WHITE SULPHUR SPRINGS, WEST VIRGINIA, ASSIGNOR OF ONE-FOURTH HIS RIGHT TO JAMES O. CLEPHANE, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN TYPE-WRITING MACHINES.

Specification forming part of Letters Patent No. **173,232**, dated February 8, 1876; application filed May 21, 1873.

To all whom it may concern:

Be it known that I, CHARLES T. MOORE, of White Sulphur Springs, in the county of Greenbrier and in the State of West Virginia, have invented certain new and useful Improvements in Type-Writing Machines; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a type-writer, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a plan view of my machine. Fig. 2 is the same with the paper cylinder and top plate removed, exposing the main cylinder, type-wheel, keys, &c. Fig. 3 is a cross-section taken through the line *x x*, Fig. 2. Fig. 4 is a longitudinal vertical section of the machine. Fig. 5 shows one of the rings of which the main cylinder is composed. Fig. 6 represents the type-wheel. Fig. 7 represents a ring with grooves in the side, one of which will be placed on either side of the type-wheel for the arms of the type to ride in. Fig. 8 shows the mechanism for moving the type.

The principal part of my machine consists of a cylinder, C, of any suitable material, with a type-wheel or circular case, D, surrounding its center. In this case or wheel there is an alphabet of such letters and characters as is intended to be used. The body of each type is made in the form of a cross, as shown in the case D, Fig. 4, and the short arms of the cross project through the sides of the type wheel or case D, and into the ring R, which is seen at either side of the type-wheel D, and also in Fig. 7.

It will be seen that this ring R is stationary, but the type-wheel D revolves with the cylinder C, carrying the short arms of the type around in the groove 1 of the stationary ring R, seen in Fig. 7. The groove 1 is a complete circle, and has no other effect on the type than to give the type a free passage in it; but the ring R has also a groove, 2, which runs around it, and is an eccentric or cam groove. The arms of the type never enter this groove 2 unless a key is depressed, but when a key is pressed by the hand the corresponding type will be forced down until its arms enter the groove 2 at the opening K^2.

Now, it will be seen that at the next half revolution of the cylinder C and type-wheel D the type that has been forced into the groove 2 will gradually move outward until it arrives at the top of the ring R, where it will be as far from the surface of the type-wheel D, and consequently from the face of the rest of the type, as the groove 2 is from the groove 1.

It will now be seen that, if a sheet of paper was placed on a suitable cylinder at the top of the type-wheel D, and at a suitable distance therefrom, as seen in Fig. 4, whenever a type passed out of the groove 1 and entered the groove 2, it would be carried around as before described, and leave an impression on the paper before being carried back to its original position, as it would be in the next half of the revolution of the type-wheel D, as will be seen by examination of Fig. 7.

I will now describe the way by which the type, *t*, are thrown with their arms from the groove 1 to 2, when desired.

To do this I will have to describe the medium between the type *t t* and the keys K K, which consists of a number of rods, *r r*, corresponding to the keys and type.

It will be seen that the type-wheel D is placed in the center of the cylinder, and that the keys are distributed equally on each side of it, and therefore the rods would get shorter as the keys came nearer the type-wheel D.

The arm r^2 of the rod *r* stands upright in the groove on the cylinder C opposite the corresponding key. The arm r^3 at the other end stands at a right angle therewith, under the corresponding type.

The main cylinder is composed of an inside cylinder, C^3, and a number of rings, C C, one of which is shown in Fig. 5. It will be seen

that these rings are all fitted on the cylinder C^3, and make the main part of the machine or the cylinder C. Each of these rings has a groove on its inside, which fits on a feather on the cylinder C^3, which holds the rings in their proper place. The rings are each grooved out on one side about half their thickness, and near their circumference the thin flange, which is left on the outside, is then turned about half down, so that when they are placed on the cylinder C^3 they will appear as seen in Fig. 4 in section; then the proper measurement is taken for the keys to enter and come out of the cylinder, and the flange is entirely removed at the entrance and exit of the keys, as will be seen in Fig. 5. The keys enter at C^1 and make their exit at C^4.

It will now be seen that if the key K were depressed by the hand it would bring the end K^2 against the cylinder C, and that when the cylinder turned around to the point C^1 the key would enter, as the flange which heretofore kept it out of the groove is entirely removed at that point. When the key enters the cylinder the flange on the cylinder runs over the cam end of the key, as shown, and keeps the key in the groove till it gets to the point C^4, where the flange is again cut out, and the incline of the cylinder being in the opposite direction to what it was at the entrance C^1, the key is forced out by the cam-movement of the incline of the cylinder, and will not re-enter until the key is again forced down on the cylinder by the hand.

It will be observed that the keys all enter on one line C^1, where the flange is removed for that purpose, and therefore any number of keys can be pressed at the same time if the word to be printed is composed of letters that come in alphabetical order, and almost any word will have two or more letters so running. For instance, the word "Abdel" can be printed at one revolution of the cylinder, all the keys being pressed at once, while the word "Absurd" would require three revolutions of the cylinder—a b s u being pressed would be printed at one revolution, and the other two letters would require a revolution for each, thus averaging two letters to each revolution of the cylinder, which is about the average of all words. Of course, there are some words that would take a revolution of the cylinder for each letter, while others, as the first given, could be printed at one.

I have taken pains to get the exact number of letters which could be averaged for each revolution, and I think about twelve letters can be printed for five revolutions of the cylinder in ordinary matter, if the operator have sufficient experience to use all that come in order.

The paper-cylinder is best understood by examining Fig. 4, in which C^2 is a cylinder, of any suitable material, placed on a shaft, S, and mounted on the frame F. This cylinder is loose on the shaft S, so that it can slide its full length thereon.

This parallel movement is independent of the shaft S; but the cylinder cannot rotate on the shaft, because a pin, *a*, in one end of the cylinder passes through a longitudinal slot in the shaft. On one end of this shaft is secured a ratchet-wheel, G, into which takes a pawl, S^2, pivoted on the top of the machine, the other end of said pawl being operated by one of the cross-arms of each type just as the type comes in contact with the paper-cylinder to release it from the ratchet-wheel and allow the paper-cylinder to revolve in unison with the type-wheel the distance of one type only.

The paper-cylinder is revolved by a belt passing over friction-pulleys on the cylinder C^3 and shaft S, as soon as the pawl is released from the ratchet-wheel and until the next tooth on the ratchet-wheel strikes the pawl, and is stopped thereby. The amount of friction is regulated by a nut on the journal of the shaft S, by the turning of which more or less friction is obtained, as required.

We will suppose a sheet of paper to be wrapped around the cylinder C^2, and we want a line printed around the cylinder and on the paper. Every time a key is pressed a type is thrown out of the groove 1 and into the groove 2 of the rings R, and carried up to the paper by the eccentric shape of said groove 2. The rotating type striking the cylinder C^2 would give it a rotary movement. Now, this sudden contact of the revolving type with the stationary cylinder would have a tendency to blur the paper; but to avoid this the top of the ring R is recessed out to the groove 2 on the side where the pawl or arm S^3 is, and a pin on this end of the pawl extends down into the groove through the recess. When a type comes in contact with the paper one of its arms, which is passing through the groove 2, comes in contact with this pin, turns the pawl upon its pivot, and releases its other end from the ratchet-wheel, thus allowing the paper-cylinder C^2 to rotate a distance equal to the type-wheel D, and thus as the paper on the cylinder and the type are moving in unison with each other there can be no blur of the letters, but always a clear impression. The paper-cylinder revolves, of course, only intermittently, or while the letter is being printed.

The paper-cylinder C^2 is moved longitudinally on the shaft S by means of a spring, d^2, placed within the shaft, and pressing against a plunger, *w*, through which the pin *a* passes, and to prevent the spring from forcing the cylinder down at once there is a rack-bar, N, provided, which has two rows of teeth on it, arranged alternately, as shown in Fig. 1. The flange *p* at the left end of the cylinder C^2 comes against one of these teeth, and the spring has no power to move it until the rod is turned around so as to move the tooth off the flange, so that when one tooth is moved off the other row comes up and occupies the space of those first moved off, only they are a little farther forward, and the spring in the shaft expands and moves the cylinder the difference between

the two rows of teeth. When the rod is drawn back to its original position the spring again moves the cylinder the rest of the distance, or the other half, so by the two movements of the toothed rod the cylinder is moved the distance between the teeth of one row, which will be the distance between the lines on the sheet when printed.

This rocking movement of the rod N may be accomplished by a pin on the shaft S striking a pin on the rod when desired to change, and turning it in one direction sufficient to enable the flange *p* on the cylinder to clear a tooth in one row and (as the cylinder is being moved by the expansion of the internal spring d^2) be caught by the succeeding tooth of the next row. A spring, S^4, connected to the rod, returns the rod to its former position when the flange *p* is caught by the next tooth of the first row.

In connection with this machine I propose to use an inking apparatus, arranged in such a manner that the type will come in contact with an inking-roller between the time it is moved outward and when it strikes the paper-cylinder.

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

1. In a type-writer, having a revolving type-wheel, with movable type therein, I claim, the combination of a grooved cylinder with inlets and outlets, a series of shafts provided with arms, and the operating-keys, whereby when the key is set the type is automatically moved outward to print the letter, and then automatically brought back again, as set forth.

2. In combination with the grooved cylinder C and type-wheel D, with radial type, the rods *r*, provided with arms r^2 and r^3, arranged substantially as and for the purposes herein set forth.

3. The rings R, provided with grooves 1 and 2, as described, in combination with the revolving type-wheel D and the cross-shaped type *t*, arranged radially in the wheel, substantially as and for the purposes herein set forth.

4. The combination, with the type-wheel D, type *t*, and grooved ring R, of the pivoted pawl S^2 and ratchet-wheel G on the shaft of the paper-cylinder, all constructed substantially as and for the purposes herein set forth.

5. The rod N, provided with a double row of teeth, in combination with the sliding paper-cylinder C^2, having flange *p* and spring d^2, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 19th day of May, 1873.

CHAS. T. MOORE.

Witnesses:
C. L. EVERT,
A. N. MAIN.