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**The Cahill
Electrical
Typewriter**

**Electricity Does the Work and
Saves the Nerves and time of
the Operator** ♪ ♪ ♪ ♪ ♪ ♪

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THE use of **ELECTRICITY** to impel the mechanism of a typewriter removes the physical and nervous strain of writing, increases the speed and output of the operator, and produces a uniformity and clearness of impression unattainable on non-electrical machines.

**The Cahill Writing-Machine
Manufacturing Company**
✦ ✦ **Washington, D. C.** ✦ ✦

Distinguishing Features of the

Cahill Electrical Typewriter.

Electricity does the Work.

One electro-magnet impels all the parts of this machine, and so makes possible

A Light Touch—

Less than one-tenth as heavy as that of non-electrical type-writers. With a touch of four ounces twenty carbon copies can be made.

A Shallow Depression of Keys—

About one-third that of non-electrical machines.

Legato, or Piano Touch—

Ability to use a running or overlapping touch—ability to depress a key without releasing the preceding key.

A Saving of One Action on each Word—

By making the space at the end of a word simultaneously with the last letter of the word.

Clean Printing.

The automatic release of the type-bar, which leaves it free to rebound instantly, insures a uniform clearness of printing otherwise impossible.

Perfect Uniformity of Impression.

All the type-bars are impelled by the same magnet in the same manner, and so strike always with the same amount of force.

Automatic Manifolding.

The greater power required for manifolding is given to the magnet by turning the rheostat handle to admit more current, without the least increase in the weight of touch.

Durability.

The parts are impelled by an external source of power, and so are made heavier and more substantial than in machines in which the parts are impelled by the force of the operator's fingers.



THE CAHILL WRITING-MACHINE MANUFACTURING COMPANY

Takes pleasure in presenting to the public an electrical typewriter. In the best non-electrical typewriters the operator has to strike the keys with sufficient force to impel the type-bars, spacing mechanism, and other moving parts; this necessitates a heavy touch and a deep depression. Further, each key has to be released quickly to enable the type-bar to return to its normal position before the next key can be depressed. This necessitates an abrupt, staccato touch. The heavy blow and staccato touch, particularly in rapid and long-continued writing, impose a severe strain upon the operator's nerves. In doing carbon work his labor is greatly increased. He has to strike the key with an increased force sufficient to make two, three, four, or even half a dozen copies.

In The Cahill Electrical Typewriter

The operator is entirely relieved of the labor of impelling the type-bars and other parts which do the printing. He need only touch the keys, and the electricity does the work. The type-bars, the ribbon, the spacing dogs, and other parts are impelled by the power of the electric current, acting through a magnet. The dip of the keys is reduced to about one-third that of non-electrical typewriters, the pressure to one-tenth. The full amount of work done on the

keys is thus reduced to about one-thirtieth of that required on the old-style machines. In addition, the automatic releasing action of the machine gives the operator double the time in which to depress each key while writing at the same rate of speed. Nor is he compelled to cultivate a uniform touch—the printing is clear and uniform, no matter how much his touch may vary.

The abrupt, staccato touch required by the old-style machines is superseded by an easy, running touch like that used on a piano. The physical strain and high nervous tension are no more, and thousands who at evening have found themselves weary and listless from the day's typewriting may now perform the same work with ease.

Electricity greatly increases the speed of the typewriter and the output of the operator. A rapid machine tends to make a rapid operator. A machine which relieves the operator of part of his work and simplifies the remaining part inevitably increases his speed and output.

The prominent and controlling principle which underlies the whole construction of the Cahill Electrical Typewriter is the employment of an efficient force other than that of the operator to actuate the moving parts of the machine and to relieve him from all burden in operating it. The force used is electricity. It is easily controlled and regulated. It is prompt, positive, unvarying, untiring, and ever ready. The influence of this outside power enters into every feature of excellence appearing in the machine.

THE most important results of the use of an external source of power may be restated, more in detail, as follows:

Minimum Depression of Keys.

The dip of the Cahill keys is about one-third that of other typewriters. Obviously it takes less time to move the finger and key through one-third the space than through three-thirds.

Light Touch.

Lightness of touch has been considered the greatest merit in a typewriter. The Cahill touch, as before said, is less than one-tenth that of the old-style machines, because the electricity does the work. Any pressure exerted by the muscles of the fingers results from a corresponding nerve pressure. It takes time—a very short time, it is true—to get up this nerve pressure, which rises gradually from nothing to the maximum required. Obviously, it is quicker to get up the nerve pressure of one-tenth required by the Cahill than that of ten-tenths required by the old-style machines.

A light touch and shallow depression mean speed and ease of operation.

Legato or Piano Touch—Automatic Releasing.

One of the severest restrictions imposed upon the operators of the old-style machines is the necessity

of releasing one key before depressing the next. The Cahill Electrical Typewriter allows the type-bar and other parts to return to their normal positions in advance of the release of the key. Consequently, it is not necessary to lift the finger from any key or keys before depressing succeeding ones. This is one of the greatest improvements ever made in the typewriter. Four important advantages result:

1. *A natural, easy touch*, instead of the abrupt staccato of the old machines, which kept the operator up to a high nervous tension.

2. *A marked increase of speed*.—In the old-style machines two actions are always required to make a letter, and before another letter can be made—the depressing of the key and the releasing of it. In the Cahill Electrical Typewriter only one action is required for the making of a letter, and before another letter can be made—the depressing of the key—the machine itself does the releasing. Thus, while the time limit on the old machines for the making of a letter is the time in which two actions can take place, the time limit on the Cahill Typewriter is that in which one action can take place.

3. *The use of all the fingers on the keys; the use of a light finger action instead of the old-fashioned, heavy wrist action*. On the old-styles machines the weight of the touch necessitated a wrist action instead of a finger action. This heavy wrist action made it difficult for the operator to use all his fingers on the keys. Many of the best operators use only the forefinger of each hand; a few use

three ; while it is very rare to find an operator who uses all his fingers. The extremely light touch of the Cahill Electrical Typewriter makes it natural for the operator to use a light, easy finger action instead of the heavy wrist motion required by the old-style machines, and he naturally uses all of his fingers, the weakest as well as the strongest, in depressing the keys.

4. *The operator has less need to look at the keys.* The legato touch, by which he is left free to keep one key down until he depresses the next, locates his hand upon the key-board—gives him position—just as in playing a piano. The result is that he ceases to look so closely at the keys, and is able to watch his copy more continuously, and to write more uninterruptedly, and so to do more work.

A Saving of One Action on Each Word.

On the Cahill, users of old-style machines may make the space in the old way—by striking the space-bar after the word. A little practice, however, will enable them to make the space simultaneously with the last letter of the word. This is done by depressing the space-bar at the same time with the key corresponding to the last letter of the word, thus making the letter and space by one action instead of two. A clear saving of one action on each word is thus effected—a saving of fully eighteen to twenty per cent of the whole work.

Uniformity of Impression.

The power of the printing blow is regulated by the strength of the electric current, and is entirely

independent of the touch. The printing is absolutely the same, whether the operator depresses the keys with a light touch or a heavy blow. To increase or decrease the weight of printing, he merely sets a handle on the machine to the position desired.

Clean Printing.

As before stated, the automatic release of the type-bar, which leaves it free to rebound the instant it strikes, insures a uniform clearness of printing which is otherwise unattainable. The Cahill Electrical Typewriter gives good, clean work, whether the operator be careless or skillful. Good work is a necessary result of the construction of the machine. It is not dependent upon the state of the operator's nerves or the uniformity of his touch.

Automatic Manifolding.

Manifolding—carbon work—has been the dread of all operators. Beginners approach it with misgivings, and expert operators with reluctance. The heaviest manifolding, however, is easily done on the Cahill Typewriter, *not* by striking the key a heavier blow, but by setting a handle to allow more current to energize the magnet. No heavier touch is required for printing twenty copies than for one. Each carbon copy is perfectly uniform, and presents a wonderful contrast to the irregular work even of good operators on the old machines.

Durability.

In all typewriters of the past many parts have had to be made lighter than the designers would wish, to

prevent the touch from becoming too heavy. In the Cahill, the use of an external source of power to impel the type-bars and other parts allows them to be made as heavy and strong as desired.

IS A LIGHT-TOUCH TYPEWRITER NECESSARY?

Few persons who have not had experience know what a tax upon the nerves of the operator rapid or long-continued typewriting involves, particularly when manifolding is done. The muscular and nervous exertion required to print a single letter is, of course, small, but when this small exertion is repeated tens of thousands of times in a day, which happens in constant writing, the total force exerted becomes large. Thus, in printing at the moderate rate of thirty words per minute, the operator makes nearly ten thousand blows in a single hour. The average operator, writing steadily, will make from sixty to seventy thousand blows in a day, while experts sometimes make as many as two hundred thousand. Each of these blows represents an action of the nerve cells as well as of the muscles, and the result is a heavy drain on the nervous system. Few forms of labor will sooner produce nervous exhaustion than steady typewriting, particularly if the work be done rapidly, or if there be much manifolding. The injurious effects of constant typewriting on the nerves, eyes, and general health of young women have long been recognized by members of the medical profession. It has often been remarked that if you give a young woman enough typewriting to do, the roses will soon leave her cheeks.

To make a light-touch machine, has been the object of typewriter inventors as well as of the leading manufacturers for many years. The introduction of ball bearings and other devices to minimize the friction bear witness to this effort. But such methods are mere palliatives; the friction in a good machine is but a small fraction of the whole resistance to be overcome. The type-bar must be set in motion with great rapidity; and to set any body in rapid motion, whether it be a type-bar, a railroad train, or a cannon ball, requires power—a power which must increase, as mathematicians say, with the square of the velocity. To overcome the inertia resistance of the key, the type-bar and other parts of the machine—the chief resistance—the operator must exert four times as much force in order to write at forty words a minute, and nine times as much in order to write at sixty words a minute, as in writing at twenty words a minute. The strain on his nerves increases in an even greater ratio; it increases approximately as the cube of the speed of writing, for (*a*) the mechanical resistance, as we have seen, increases as the square, and (*b*) the time in which the operator must get up the nerve pressure to overcome this resistance decreases directly as the speed increases; in other words, to write twice as fast he must get up four times the nerve pressure in one-half the time, which requires an increase of eight-fold in the nervous tension. The result is well known—high-speed writing soon fatigues the strongest man. The average operator who attempts to write a practice sentence at the top of his speed—say 100 or 120 words per minute—

and keeps it up for five or ten minutes, is apt to display in quick and heavy breathing and otherwise the same symptoms of severe exertion which he would show in running a race.

Enough has been said to show the necessity for a radical change in the plan of typewriter construction. The Cahill Electrical Typewriter exhibits the necessary changes in a successful form. It reduces the labor and strain, as we have seen, to an extent hardly dreamed of by operators heretofore.

The Cahill Electrical Typewriter appeals strongly

To the Operator

Because it lightens and shortens his labor, and saves his nerves and eyes ;

To the Business Man

Because it increases the speed of his operator and enables him to do more work in an hour or a day;

To both Business Man and Operator

Because it greatly improves the quality of the work turned out, and enables the poor operator, or the beginner, to do clearer and more uniform printing than the most skillful operator can do on the old-style machines. Uniformity and clearness of printing are reflections of the merits of the machine and not of the experience or skill of the operator.

ELECTRICITY DOES THE WORK.

