

(No Model.)

2 Sheets—Sheet 1.

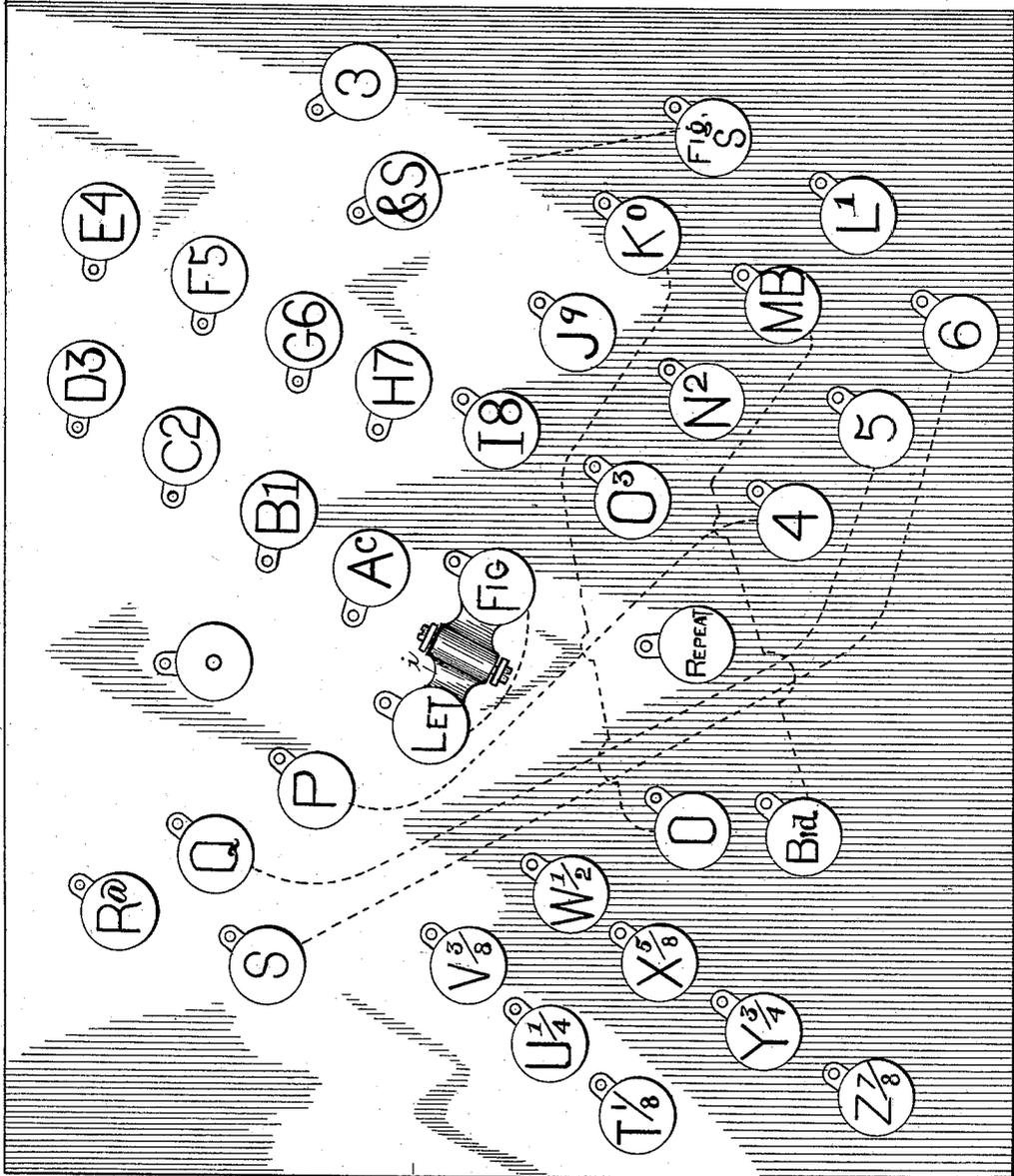
C. L. HEALY.

PRINTING TELEGRAPH TRANSMITTER.

No. 366,166.

Patented July 5, 1887.

FIG. 1.



ATTEST:
Ed. J. [Signature]
Wm. [Signature]

INVENTOR:
 Clarence L. Healy
 By Dyer & Seely
 Attys.

UNITED STATES PATENT OFFICE.

CLARENCE L. HEALY, OF BROOKLYN, ASSIGNOR TO THE COMMERCIAL TELEGRAM COMPANY, OF NEW YORK, N. Y.

PRINTING-TELEGRAPH TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 366,166, dated July 5, 1887.

Application filed February 1, 1887. Serial No. 226,146. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE L. HEALY, of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Printing-Telegraph Transmitters, of which the following is a specification.

My invention relates to the key-boards of printing-telegraph transmitters; and its principal object is to produce a key-board and attachments which will facilitate the transmission of stock quotations and other intelligence, and enable a much greater rapidity of operation to be maintained. A further object is to simplify the construction of the parts, and more especially the key-contacts and the devices for controlling the local unison or shifting circuit. I accomplish the first object partly by a peculiar arrangement of the keys approximating the shape of the letter X, a St. Andrew's cross, or saltier, so that they will accommodate themselves to a natural rocking movement of the hands from the thumbs to the fingers, and also by the provision of duplicate keys situated on opposite sides of the board and coupled together through their electrical connections, so that no possible quotation will require the crossing or twisting of the hands in its transmission. This and other features of invention will be more fully hereinafter explained, and pointed out by the claims.

In the accompanying drawings, forming a part hereof, Figure 1 is a plan view of the top of the key-board, the dotted lines indicating the electrical coupling of duplicate keys; Fig. 2, a plan view of the under side of the key-board top thrown back, part of the box below being also shown, and Fig. 3 a sectional view showing the unison keys and connecting devices.

The views of the drawings show the apparatus in full size.

The arrangement of the keys approximates, as shown in Fig. 1, the form of the letter X, a St. Andrew's cross, or saltier. At the center of the board are the two keys marked "Let" and "Fig." controlling the local shifting-circuit, shifting the printers from one type-wheel to the other and causing the unison dots to be printed. These keys depress the opposite

ends of a lever, the function of which will be explained further on, and they are arranged on an oblique line, so that they can be worked by the thumbs without interference, the ends of the thumbs passing and overlapping if brought at the same time above the two keys. Directly beneath the shifting-keys is the repeating-key, marked "Repeat," and above such shifting-keys is the key for printing a dot without shifting, which is marked with a small circle. The repeating and dot keys are placed on a central vertical line, since they are the only keys designed to be worked by both hands. These two keys and the keys "& S" and "3" on the extreme right of the board are not included within the lines of the X-shaped arrangement; but the remaining keys approximate that shape and give the character to the board, as before stated. It will also be noticed that the X shape is deviated from somewhat by the placing of a greater number of keys on the right-hand side of the board than upon the left-hand side. This is intended to throw a preponderance of work on the right hand of the operator, which is a desirable thing to do.

Heretofore key-boards for printing-telegraph transmitters have generally been made with a straight or circular arrangement of the keys, without regard to the positions which the hands of the operator have to assume in practice in order to enable him to finger the keys with ease and rapidity, the result being that the operator was obliged to twist his hands into awkward and strained positions to reach the key of the next character to be printed while holding depressed the key of the character just printed, which becomes necessary in order to save time in printing sequential characters, or those that follow closely upon the type-wheels; hence combinations frequently occur in which, although the keys to be successively depressed are on the same side of the board, they cannot be reached by the same hand, and it becomes necessary to cross the board with the other hand in order to relieve or "free" the first hand, so that the transmission may be continued. My key-board, however, is so designed that each hand frees itself in actual operation, and this allows each

hand to be ready to relieve the other, so that any combination of the keys can be easily and quickly produced without any twisting or crossing of the hands. In the arrangement of the keys, as shown, which accommodates itself to the natural position of the hands, the thumb and forefinger usually do the greater part of the work, the fingers being either bent or straightened to reach any key. All the keys on each side of the board are within easy reach of either the fingers or the thumb with a free rocking movement, and no two keys are so far apart but that one can be easily reached while holding the other depressed. The order of placing the characters upon the keys is a matter of small moment, and hence can be varied at will, the work of the operator not being materially changed by any special order of the characters on the keys.

As shown by the dotted lines in Fig. 1, certain of the keys are connected together. These dotted lines indicate wire-circuit connections between the contacts which are touched by the keys, which contacts will be explained further on, the keys connected together producing the same effect on the transmitter-circuit, and being, in fact, duplicate keys located for convenience on different parts of the board. This is a matter of considerable advantage, the keys most frequently used being duplicated giving greater liberty and rapidity in working, since for certain matter one hand can free the other.

In key-boards having a circular arrangement of the keys constant crossing of the hands from one side to the other is necessary in order to depress a key soon enough after the release of the preceding key to print the character on the same revolution of the type-wheel. If the letter A is printed, and it is desired to next print the letter C, the key of C has to be depressed in time after the key of A has been released to insure the stopping of the transmitter controlling the printer at the letter C on the same revolution of the type-wheel. If the operator allows the type-wheel to revolve past C, he will have to wait until it comes around again, and this time will be lost.

Since the speed of the type-wheels in modern printers is great, it will be seen that in the manipulation of the key-board one key has to be held until the next is depressed, or the movement from one to the other must be free and rapid. Another peculiarity entering into the manipulation of printing-telegraph key-boards which makes my arrangement of keys a great advantage, is the necessity for holding each key depressed until the transmitter has completed its movement and the character has been printed; hence the natural and easy rocking movement of the hand from one key to the other permitted by my key-board is a great advantage. The movement required of the operator for a printing-telegraph key-board, it will be seen, is quite different from that required by a type-writer, the operator of which can strike one key at a time and release it, and strike another at any time, without having to wait for

a type-wheel to revolve to that particular character, and without being obliged to strike one key within a definite short time after releasing the preceding key.

As an illustration of the operation of my key-board, we will follow the manipulations of the keys required to print the stock quotation "N P R R. 300. 106½. S3." The hands of the operator rest naturally on the key-board, each hand covering the keys on its side of the board. The letter "N" is printed with the right hand. The "P" is depressed with the left hand, and is held depressed while the repeating-key is struck with the right hand to print the second letter "P." The letter "R" is printed with the third finger of the left hand. The shifting-lever key marked "Fig." is then depressed by the thumb of the right hand, printing the dot after "R" and shifting the printers to the figure-wheel. The forefinger of the right hand then depresses the key 3, the thumb of the left depresses the cipher-key, and the repeating-key is struck with the right hand. The forefinger of the left hand is placed on the dot-key at the upper center of the board to print the dot dividing the number of shares from the price. The figure "1" is then printed by depressing with the thumb of the right hand the key at the lower right-hand side of the board, such key being one of the lower bank of numerals. The cipher just above is then depressed by the forefinger of the right hand, and the key "6" of the lower bank by the thumb of the right hand. The key "½" is then depressed by the thumb of the left hand, and the "S3" at the right center of the board by the fore and middle fingers of the right hand. The shifting-key "Let" is then depressed by the forefinger of the left hand and the printers are shifted to the letter-wheel, ready to go on with the next quotation. It will be seen that each hand is constantly being relieved by the other. Each hand has an average of two characters to print successively; but if, as in news printing, more than two characters are required to be printed in succession by one hand from the same side of the board, it can readily be done, since all the keys are in position to be reached by the fingers and thumb without twisting or crossing of the fingers, and without the necessity for crossing over with the other hand to relieve the first hand.

My key-board may be considered as divided into two parts by an imaginary line passing through the dot and repeating keys, the keys on each side of this line being operated entirely by one hand. It will be seen that even with the duplicate keys there is no crowding or confusion of the keys. This key-board is more especially desirable when the figure-wheels of the printers have a double set of whole numbers, since with a circular board the position of the keys would be such that it would be nearly impossible to finger them with the desirable rapidity. The straight key-board has also the same disadvantages, it being impos-

sible with such a board, as well as with a circular board, to reach sequential keys where letters or figures follow each other closely. The various keys pass through the top *a* of the key-board and through a metal plate, *b*, below it, while spiral springs *c* surround the keys between the top *a* and plate *b*, and throw such keys upwardly. Below the top *a* of the key-board and below the plate *b* is the base *c* of insulating material, which may be a block of hard rubber. Upon the base *c* are mounted springs *d*, which are held down at one end by screws *e* and rise above the base at their other ends. These raised ends of the springs are held by the heads of screws *f* turning into the base *c*, and by adjusting the screws *f* the elevation of the raised ends of the springs above the base can be varied. These springs have platinum contacts near their raised ends, as shown. The ends of the key-stems are finished with platinum and normally stand above and out of contact with the springs, as shown in Fig. 3. The top *a* of the key-board and the plate *b* are connected electrically with the revolving arm of the transmitter "sunflower," as usual, while the springs *d* are connected electrically each by a wire leading to a block of the sunflower, as usual, except in the case of the springs of duplicated keys, such latter springs being connected together and by one connection with the same block of the sunflower. This is illustrated in Fig. 3, the two springs therein shown being connected by a wire, *g*, while a wire, *h*, connects both of them with the sunflower. The keys marked "Let." and "Fig.," besides making contact with springs *d*, also serve to tilt a lever, *i*. This lever has an arm, *k*, extending through the top *a* of the key-board, and engaging by a point, *l*, with a roller on the end of a plate-spring, *m*, which serves to hold the arm *k* and the lever *i* at each limit of its movement. A piece, *n*, of insulation on the end of the arm *k* strikes, in moving in one direction, a spring-retracted lever, *o*, and separates it from a contact, *p*, opening by so doing the local circuit, including the shifting-relays, for effecting the shifting from one type-wheel to the other. When the lever *i* and arm *k* are thrown in the opposite direction, the contact-lever *o* is released and again closes such local shifting-circuit.

What I claim is—

1. In a key-board for printing-telegraph transmitters, the keys thereof divided into two sections located on laterally-opposite sides of the board, the keys on each side or section being divided between upper and lower banks or groups, which are arranged on lines diverging from the center of the board, the keys of

each section being designed for manipulation by one hand only and by a rocking movement of the hand, substantially as set forth.

2. In key-boards for printing-telegraph transmitters, the combination of keys thereof arranged in four banks or groups on lines diverging or radiating from the center of the board with the shifting-keys located at the center thereof, substantially as set forth.

3. In key-boards for printing-telegraph transmitters, the combination of keys thereof arranged in four banks or groups on lines diverging or radiating from the center of the board with the shifting-keys located at the center thereof and the repeating and dot keys above and below such center, substantially as set forth.

4. In key-boards for printing-telegraph transmitters, the combination of keys thereof arranged in four banks or groups on lines diverging or radiating from the center of the board with the shifting-keys located at the center thereof, such shifting-keys being arranged obliquely, substantially as set forth.

5. In key-boards for printing-telegraph transmitters, the combination of keys thereof arranged in four banks or groups on lines diverging or radiating from the center of the board, and the keys "S3," located at the right center of the board, substantially as set forth.

6. In key-boards for printing-telegraph transmitters, the keys thereof divided into two sections located on laterally-opposite sides of the board, the keys of each section being designed for manipulation by one hand only, the keys on each side or section being divided between upper and lower banks or groups, which are arranged on lines diverging from the center of the board, in combination with electric connections between the contacts of duplicate keys located on opposite sides of the board, substantially as set forth.

7. In key-boards for printing-telegraph transmitters, the combination, with the keys and the insulating-base *c*, of the contact-springs *d* and the screws *f*, turning into the base and holding by their heads the raised ends of the contact-springs, substantially as set forth.

8. In key-boards for printing-telegraph transmitters, the combination, with the shifting letter and figure keys, of the lever *i*, arm *k*, spring *m*, and the contact-lever *o*, substantially as set forth.

This specification signed and witnessed this 29th day of January, 1887.

CLARENCE L. HEALY.

Witnesses:

WM. PEZER,
E. C. ROWLAND.