C. T. CHESTER.

ALPHABETICAL TELEGRAPH.

No. 34,480. Patented Feb. 25, 1862.

Fig. 1.

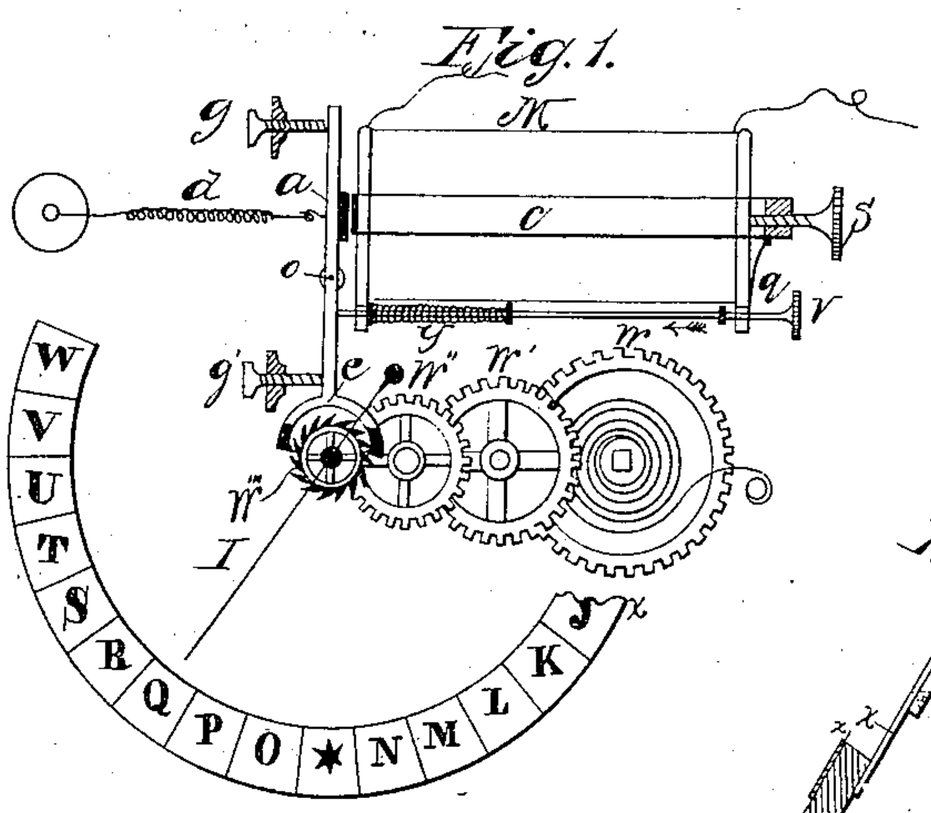


Fig. 3.

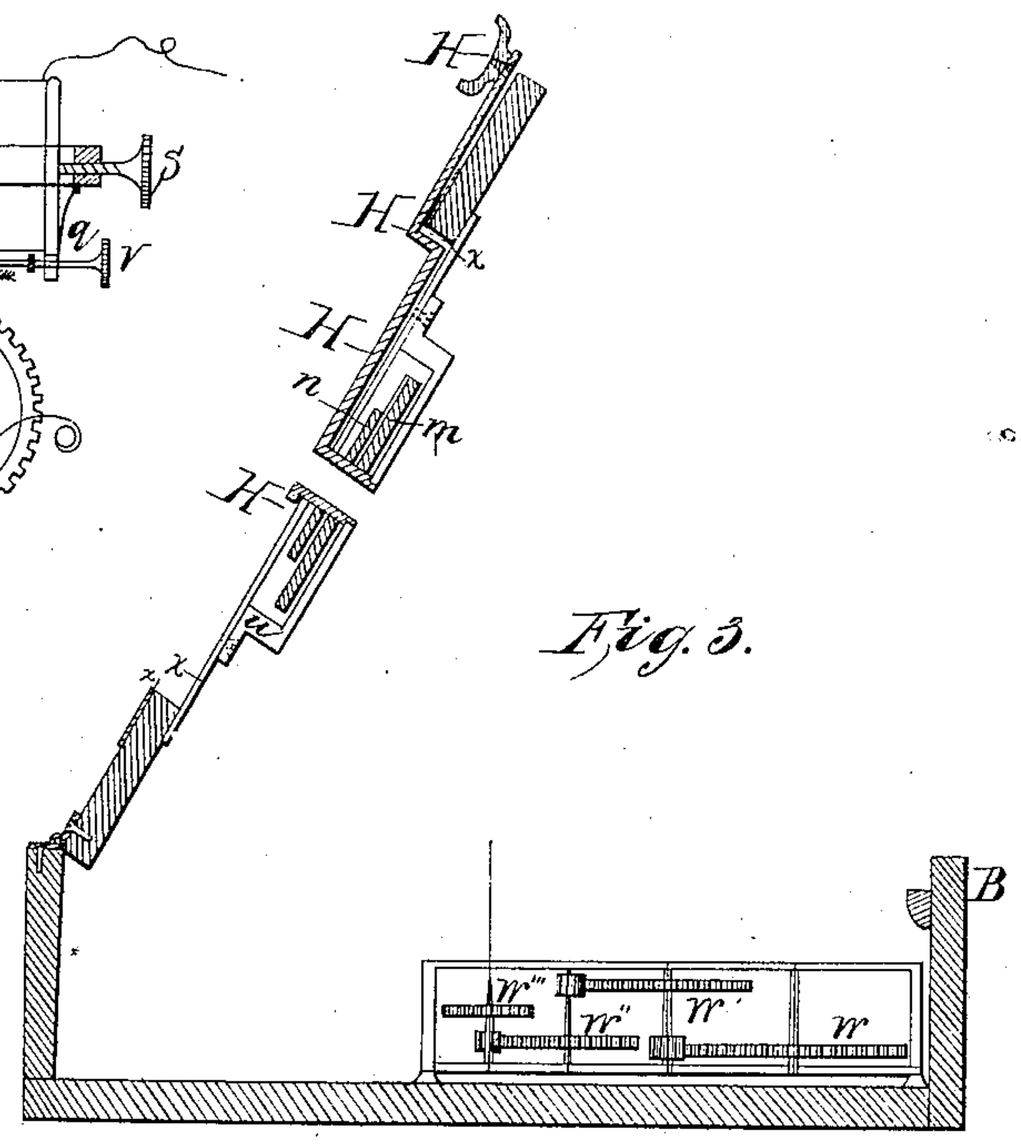


Fig. 2.

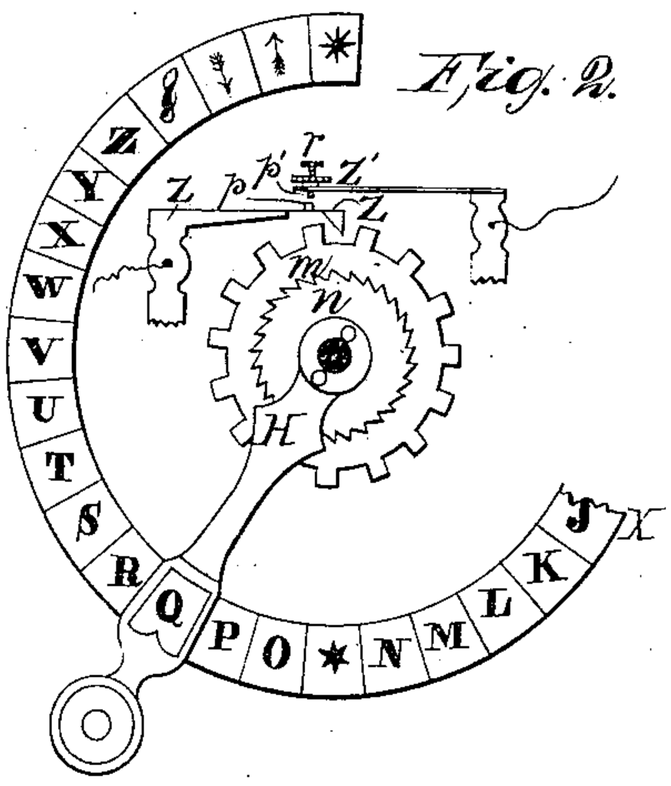
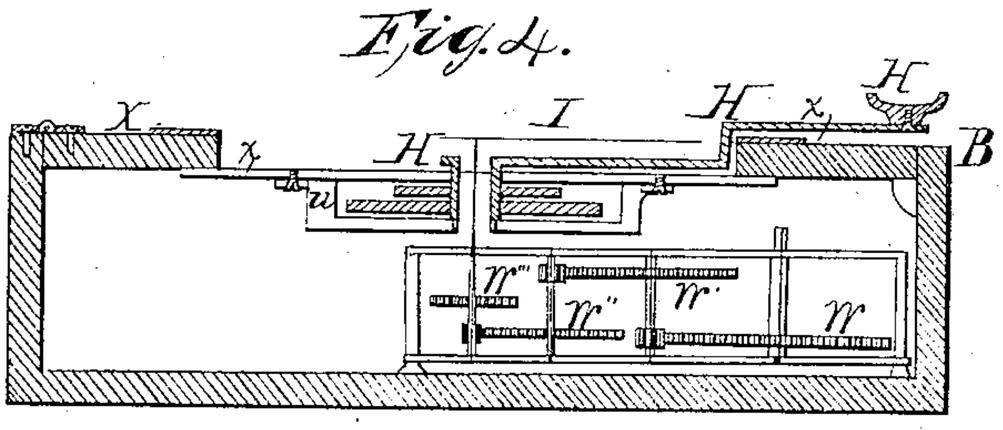


Fig. 4.



Witnesses:

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Inventor:

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UNITED STATES PATENT OFFICE.

CHARLES T. CHESTER, OF NEW YORK, N. Y.

IMPROVEMENT IN ALPHABETICAL TELEGRAPHS.

Specification forming part of Letters Patent No. **34,480**, dated February 25, 1862.

To all whom it may concern:

Be it known that I, CHARLES T. CHESTER, of the city, county, and State of New York, have invented certain Improvements in Alphabetical or Dial Telegraphs; and I hereby declare that the following is a full, clear, and exact description of the same.

My improvements consist in so arranging the parts of the needle-driving machinery of alphabetical telegraphic instruments that, first, the least possible force of electro-magnetism may work them; secondly, the greatest exactness and certainty may be given to the transmitting or circuit-breaking apparatus; thirdly, the transmitting and receiving apparatus may be combined or separated at will, so that the same lettered dial may be used for both.

Referring now to the drawings that accompany this specification, the letters of which in the different figures indicate the same parts, Figure 1 is an outline view of the relative parts of the receiving apparatus; Fig. 2, an outline view of the relative parts of the transmitting apparatus; Fig. 3, a cross-section of the receiving and transmitting apparatus separated, and Fig. 4 a cross-section of the same united or combined.

In the receiving apparatus I use a delicate train of clock-wheels, *w w' w'' w'''*, propelled by spring or weight. The last of the train, *w'''*, is an escape-wheel, the number of whose teeth is half the number of letters or signs to be expressed. The shape of the teeth is perfected and adapted to the pallets *e*, so that each tooth is released with the least possible resistance.

To the pallet-lever *a o e* is attached the armature *a*, acted on by the electro-magnet M, which may be of any desired size, but which should be adjustable in power, and for the purpose I prefer the adjustable form patented to me September 4, 1860, and of which an imperfect view is shown in Fig. 1, *s* being the screw to push the core *c* away from the armature *a*, and *q* the spring to pull it toward *a*. When a current of comparatively feeble power is passed through the wires of this magnet it gives power enough to attract the armature *a*, cause the lever to turn at *o*, and the pallet on the left to release one tooth. When the magnet-power is withdrawn a spring, *d*, pulls the lever in a reverse direction and a pallet on the right releases one tooth. Thus the magnetic vibrations, by allowing the escape of successive teeth of *w'''*, allow the fine needle or indicator I to traverse step by step and point successively to the letters on the dial *x*. The magnet, clock-work, escape-wheel, and needle, when connected with a lettered or numbered dial-plate, constitute the whole of the receiving apparatus.

The transmitting apparatus, Figs. 2, 3, and 4, consists of an arm or pointer, H H H H, whose shape obviously allows it to pass over and around the dial without obscuring the letters. This pointer is attached transversely to a hollow shaft, with which it revolves, carrying the wheels *n* and *m*. This hollow shaft has bearings in the plate *t* and the supporting-plate *u*, the pointer being above the plate *t* and the wheels below it. *n* is a ratchet-wheel, which, with its pawl, (not shown in the drawings,) prevents the pointer from moving backward. *m* is a wheel, shaped as in Fig. 2, whose teeth correspond in number with the teeth of the escape-wheel. This wheel *m*, in its revolution, brings the platina points *p* and *p'* firmly together, thus closing circuit. As each tooth of the wheel presses upon the triangular projection on the under surface of the flat spring *z z* it raises the spring, and with it the platina wire *p*. Before the spring is at its highest elevation *p* meets *p'*—a corresponding platina wire on the under surface of another flat spring, *z' z'*. *p'* can, however, being fixed to a screw, *r*, be brought more or less near *p* and the contact between them made more or less firm, since the nearer these points are the more pressure is exerted by the spring *z' z'*. Jarring vibration is prevented by the support extending from the pillar *k*, which serves, as does *l*, to convey the current. This plan for breaking and closing circuits quickly and steadily is found very efficient and easily kept in order.

The combination of the receiving and transmitting apparatus is shown in Figs. 3 and 4. The receiving parts are placed firmly in the bottom of a box, B, the needle-shaft occupying the exact center. The transmitting part is attached to the hinged lid of this box, with its hollow shaft also in the exact center of the lid. The needle-shaft passes through the hollow shaft of the transmitter, and a very light needle is

dropped easily in its place on the square top of the shaft. Thus one dial, *x*, answers both for the receiving and transmitting apparatus, although in their functions they may be distinct and unconnected. This peculiar arrangement secures several good ends: first, facility in working, as the operator can see at the same time whether his apparatus is in order, as his own needle should follow exactly the movement of his pointer; second, great ease in examining and adjusting the different parts of the apparatus by raising the lid.

The manner of using the instruments is as follows: Electrical connection is established between two or more instruments by leading one end of the wire of the magnet of the receiving part of the instrument through any required length of conductor to one end of the magnet-wire of the other instrument. The other end of the magnet-wire of each instrument passes to the pillar *l* of the transmitter, thence, when *p* and *p'* connect, to the pillar *k*, and thence to the galvanic battery and ground-wire or its equivalent. It will be seen that every time *p* and *p'* touch each other the circuit is closed, and when they recede it is broken. The usual adjustments being made to adapt the magnet's motion to the strength of the electric current, the lid being closed and the needle set on its shaft, the first movements are to secure unison between the two or more instruments in electric connection. The pointers are first turned around to & or any character produced by an open circuit by mechanically vibrating the pallet-levers by a little pushing-rod projecting from the boxes, and which is shown (Fig. 1) at V. This rod passes easily through two supports connected with the magnet-frame. By the finger this rod is pressed in direction of the arrow against the lever *a o e*, which forces the pallets to move to the left, releasing one tooth of the escape-wheel. On taking off the finger the spiral spring *y* forces the rod back again, and the spring *d* causes the lever to move and the pallets to move to the right, releasing another tooth. Thus the needles are also quickly brought to &. Moving the pointer, now, one letter forward, all instruments are in unison, and he who wishes to send a message turns his pointer around, always in one direction, over the letters, pausing a moment at any one which he may wish to indicate. The needles of the other instruments follow exactly the movement of the pointer, resting at each indicated letter. Thus words and sentences are easily spelled out. To indicate the end of a word a pause is made at either of the stars (*) at the top or bottom of the dial, whichever may be nearest to the last letter of the word.

This general mode of telegraphing has been long used; but in every form with which I have been able to make myself acquainted the pallets have either been made to propel or force forward the escape-wheel, or else the escape-wheel shaft is made to carry an intermitting wheel and apparatus, either of which plans is attended with too much friction to make the instruments serviceable on long lines. Again, in the construction of the best forms of these instruments two separate dials are used, which is an evident disadvantage, as the eye cannot look at two dials at the same time. By divesting the receiving apparatus of all superfluous work, and making it of the finest clock-work gear, and carrying a very light needle, I am able without difficulty to transmit messages over two hundred miles.

Disclaiming, therefore, as my invention the general features of alphabetical telegraphs, and which are only described in these specifications to make the improvements more clearly understood,

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The use, in alphabetical telegraphs, of a train of wheels actuating an escape-wheel, in connection with pallets actuated by electromotive force, when these parts are combined to operate an indicating-needle, substantially in the manner set forth.

2. The handle or pointer, with its hollow shaft, ratchet-wheel, toothed wheel, two springs, with adjustable points, combined substantially as described, and forming the transmitting apparatus.

3. The arrangement for combination of these two parts of the complete instrument, so that one dial answers for receiving and transmitting apparatus, and the parts may be instantly separated and examined, substantially as described.

Dated at New York, December 9, 1861.

CHARLES T. CHESTER.

Witnesses:
JOHN DAVIDSON,
PETER D. KENNY.