L. S. CRANDALL.

Automatic Telegraph-Key.

No. 168,143. Patented Sept. 28, 1875.

Fig: 1.

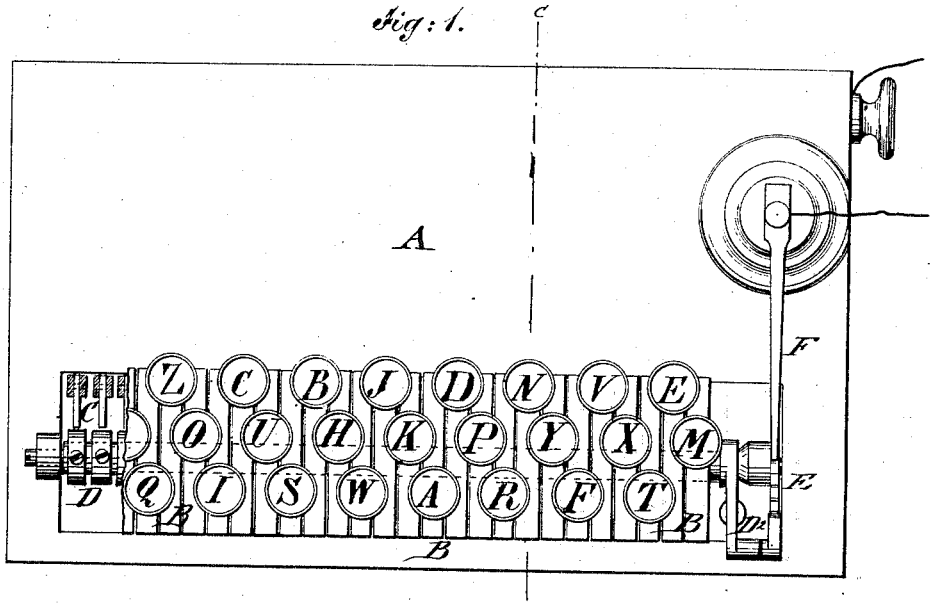


Fig: 2.

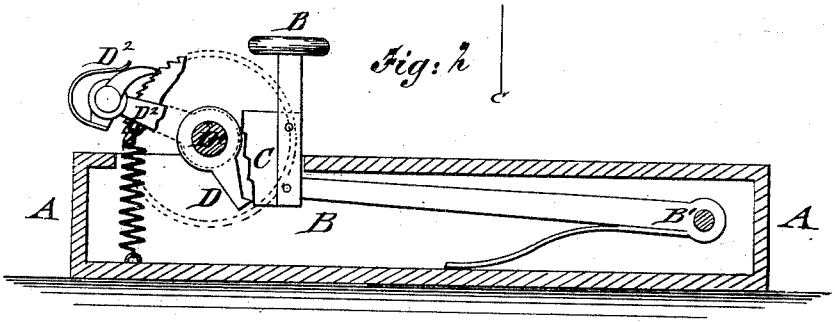
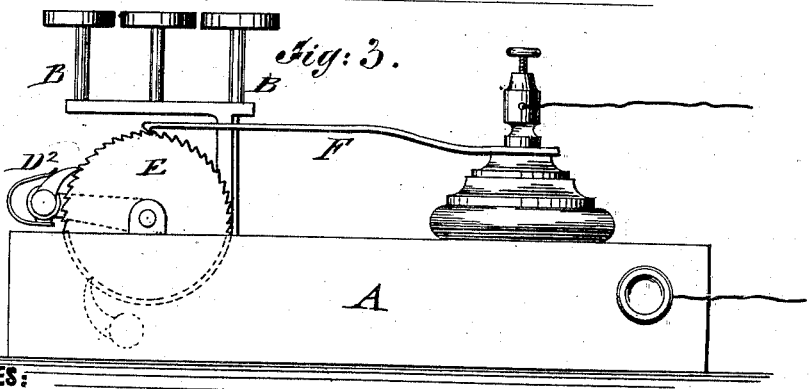


Fig: 3.



WITNESSES:

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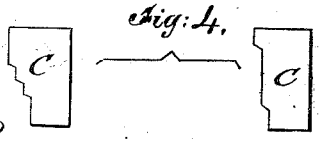
Fig: 4.



INVENTOR:

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UNITED STATES PATENT OFFICE

LUCIEN S. CRANDALL, OF NEW YORK, N. Y.

IMPROVEMENT IN AUTOMATIC TELEGRAPH-KEYS.

Specification forming part of Letters Patent No. **168,143**, dated September 28, 1875; application filed August 21, 1875.

CASE A.

To all whom it may concern:

Be it known that I, LUCIEN S. CRANDALL, of the city, county, and State of New York, have invented a new and Improved Automatic Telegraph-Key, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a top view; Fig. 2, a vertical transverse section on the line *c c*, Fig. 1; Fig. 3, an end elevation; and Fig. 4, detail side views of the actuating cam-pieces of my improved automatic telegraph-key.

Similar letters of reference indicate corresponding parts.

The object of my invention is to produce a mechanical device or automatic key for telegraph purposes, by which a greater speed, certainty, and uniformity are obtained in the transmission of telegraphic messages, to be used in place of the common telegraph-key.

The invention consists of a series of pivoted spring-keys or finger-levers, with the different letters of the alphabet, which levers come, by cams of varying shapes, in contact with projecting arms of the shaft, that operates, by a spring-pawl, a ratchet-wheel, which closes the circuit by the contact of the teeth with a metal tongue connected to one pole, while the key-shaft and ratchets are connected to the other pole.

In the drawing, A represents a metallic base-plate of my automatic telegraph-key, which is provided with a series of spring-acted keys or levers, B, that are pivoted to a shaft, B′. The keys or levers B are of elbow shape and placed sidewise of each other, as many levers being arranged as there are letters of the alphabet, each key having a button with a letter marked thereon, and grouped in such a manner that the more frequently used letters are placed together, while the less frequently occurring letters are placed near the ends. Each key B is constructed near its angular part with a cam or contact plate, C, that passes in front of and operates a projecting pointed arm, D, of a longitudinal shaft, D^1, placed in front of the cam-plates C. Each depression of a key causes the shaft to turn partially upon its axis, which movement is made intermittent or irregular, according to the face of the cam. The shaft D^1 is connected, by a fixed arm and pivoted spring-pawl D^2, with a ratchet-wheel, E, which is moved according to the face of the cam, and held in stationary position, while the shaft D^1 is returned into its former position, by a spiral spring attached to the pivot-arm D^2, simultaneously with the return of the cam. A metal tongue, F, is secured, by an insulated base-piece, to the base-plate of the key, and serves, in place of the ordinary Morse key, to open and close the circuit by contact or non-contact with the teeth of the ratchet-wheel. The movement of the ratchet-wheel is controlled by the shape of the cams C, which are made with step-shaped projections and intermediate pieces of varying length, so that an irregular movement of the wheel is produced, to give, by the contact with the tongue, a dot, a dash, or a combination of both. When the metal tongue is not in contact with a tooth of the ratchet-wheel the circuit is open, as the base-plate and wheel are in connection with one, the tongue in connection with the other, pole of the battery. If the cam is so shaped that its contact with the crank-arm of the shaft moves the wheel forward one tooth, the tongue will come in contact therewith and close the circuit for the duration of the contact, registering a dot. If the cam is made with a straight extension-piece back of the step, moving the wheel, the tongue will stop or "dwell" on the tooth moved during the passage of the cam over the arm of the shaft, and register a "dash." The position of the tongue between the teeth of the ratchet-wheel breaks the circuit and produces a "space." If, therefore, every cam is shaped in suitable manner by steps and extensions, that the Morse character of the letter of its key is produced, words may be telegraphed mechanically by simply depressing the required keys.

By some practice a very rapid and reliable mode of transmitting messages is produced, as each key, when depressed, produces the exact corresponding Morse character on the sounder, one shaft, ratchet-wheel, and tongue serving for all the keys jointly.

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

1. An automatic telegraph-key composed of a series of pivoted spring keys or levers, provided with cam or contact pieces of varying shape, corresponding to the Morse character of their letters, in combination with projecting arms of a common transmitting-shaft, spring-pawl, ratchet-wheel, and insulated metal tongue, the keys, shaft, and ratchet being connected to one pole, the tongue to the other pole, of the battery, to transmit messages by mechanical means, substantially in the manner and for the purpose set forth.

2. The shaft provided with a series of cam-operated arms, D, and a single pawl-arm, having a spring-retractor, as and for the purpose set forth.

3. In automatic telegraph-keys, the spring-keys or finger-levers, provided with cam or contact pieces having step-shaped projections and intermediate extensions, for producing the required feed of the ratchet and the dwell at points of contact and non-contact, substantially as specified.

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Witnesses:
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