(No Model.)

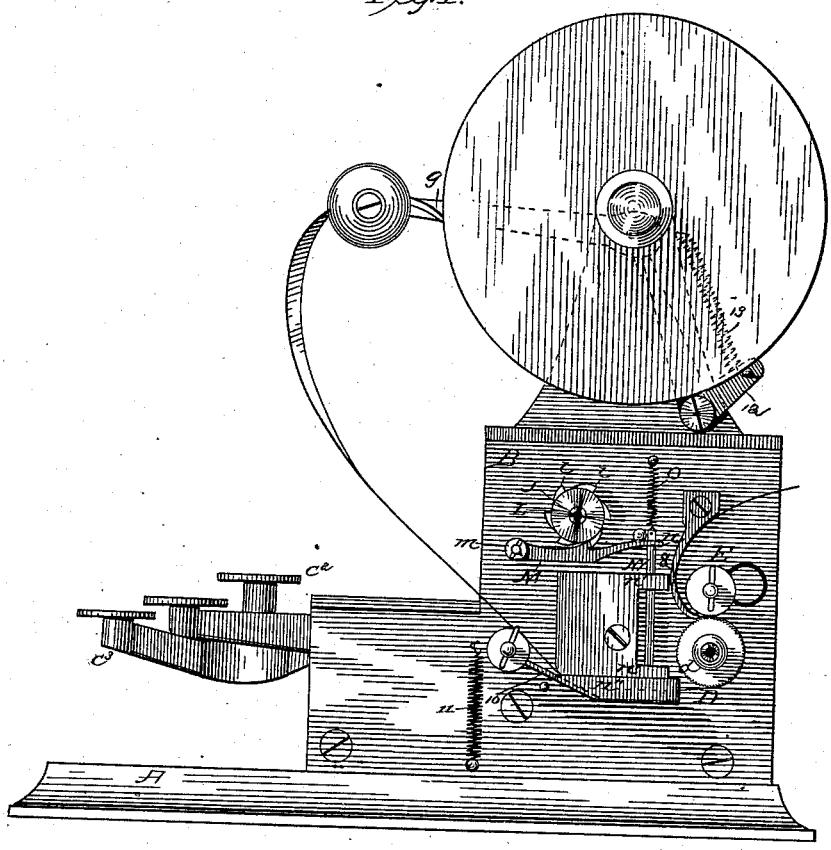
2 Sheets—Sheet 1.

F. ANDERSON.

TELEGRAPHIC PERFORATOR.

No. 265,213. Patented Sept. 26, 1882.

Fig. 1.



Attest:
Walter Smaldon
David S. Mead

Inventor
Frank Anderson
By Ellis Spear
Atty

(No Model.)

2 Sheets—Sheet 2.

F. ANDERSON.

TELEGRAPHIC PERFORATOR.

No. 265,213. Patented Sept. 26, 1882.

Fig. 2.

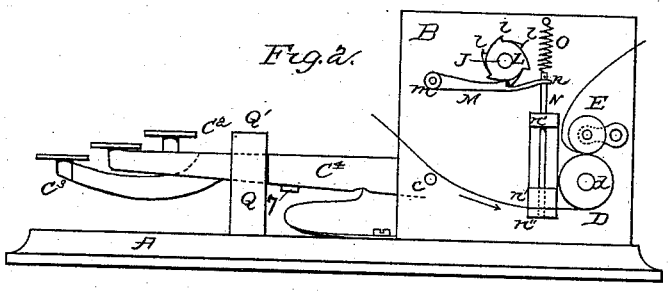


Fig. 3.

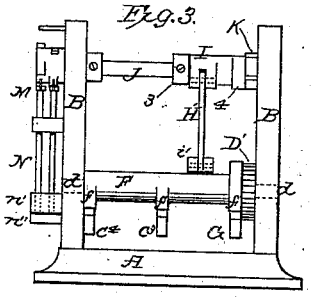


Fig. 4.

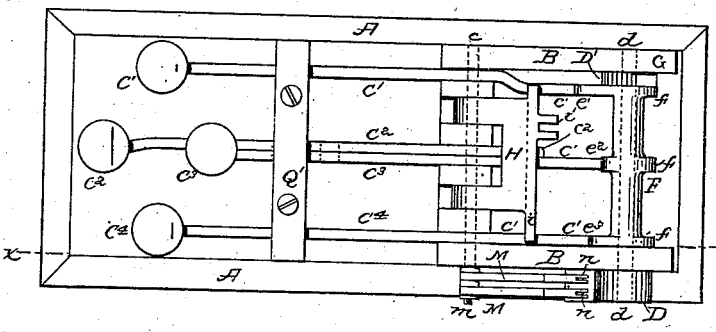


Fig. 7.

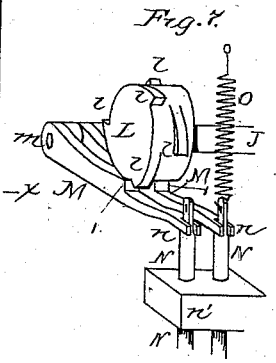


Fig. 5.

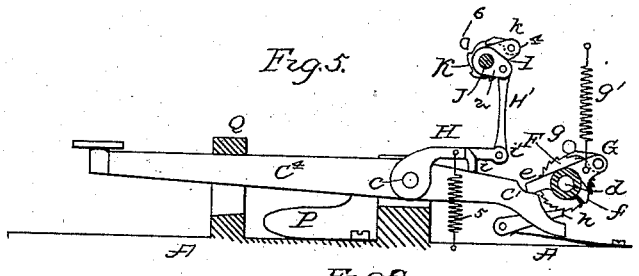


Fig. 6.

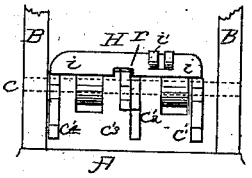


Fig. 8.

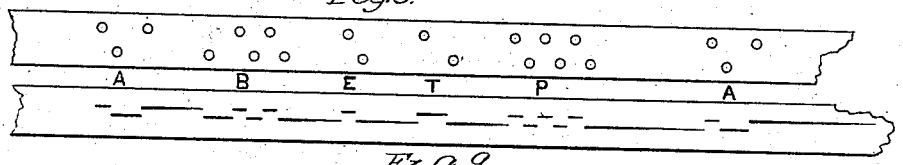


Fig. 9.

Attest

Walter Donaldson

David S. Mead

Inventor

Frank Anderson

By Ellis Spear

UNITED STATES PATENT OFFICE.

FRANK ANDERSON, OF PEEKSKILL, NEW YORK, ASSIGNOR TO THE AMERICAN RAPID TELEGRAPH COMPANY, OF CONNECTICUT.

TELEGRAPHIC PERFORATOR.

SPECIFICATION forming part of Letters Patent No. 265,213, dated September 26, 1882.

Application filed January 6, 1882. (No model.)

To all whom it may concern:

Be it known that I, FRANK ANDERSON, of Peekskill, county of Westchester, State of New York, have invented certain new and useful Improvements in Telegraphic Perforators; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the drawings accompanying this specification.

My invention relates to telegraphic perforators, and is designed specially to perforate the fillets for that system in which positive and negative impulses are transmitted alternately over the line, each one of which impulses, whether positive or negative, is utilized at the receiving end to make marks composing part of the record.

The object of my invention is to produce an instrument of simple construction and reduced in size in order to render it less expensive, more portable, and capable of operation by means of the fingers without any extraneous power. This instrument is not designed to supplant that shown in Letters Patent granted to Anderson and Foote, No. 228,585, (which machine is used at the larger stations,) but is intended for the smaller outlying or temporary stations.

The principle of my invention requires that the transmitting-perforations shall be in two lines, that the perforations shall be made alternately in one and the other line, the strip being fed after each perforation.

In my invention are the following features: First, each punch-key operates alternately one of a pair of punches first on one side and then on the other, and at the same stroke by which it causes a perforation it permits the punch to rise, moves back the feed mechanism an invariable distance, and when it rises permits the paper to be fed an invariable distance; second, two, three, or more of such keys (preferably three) are combined, so that each operates alternately and independently the same pair of punches, and operates also independently to give a different amount of feed to the fillet, in the manner heretofore described; third, with punch key or keys thus operating alternately on the pair of punches is combined a space-key adapted to operate upon the feed mechanism alone.

My invention also includes details of construction, all of which are set forth fully hereinafter and distinctly claimed.

In the accompanying drawings, Figure 1 shows a side elevation of my apparatus; Fig. 2, a like elevation with part of the case removed; Fig. 3, an elevation of the rear end; Fig. 4, a plan view with the top of case removed; Fig. 5, a section on line *x x* of Fig. 4, only one key-lever being shown. Fig. 6 is a view of the oscillating frame and lever from the rear, with the feed-shaft removed. Fig. 7 is a perspective view of the punches and devices immediately operating them. Fig. 8 represents a fillet perforated by this apparatus, and Fig. 9 the record made thereby at the receiving end of the line.

In the system heretofore referred to, in which impulses of opposite polarity transmitted alternately over the line are all used in recording, it has been customary to use a series of perforations in order to represent the dash. This series, however, is not necessary, particularly on lines of any considerable length, where the tailing of a single impulse is sufficient for the purpose.

In the invention which is the subject of this application I prefer to use, for the sake of simplicity, only a single pair of punches. In the drawings these punches are shown in Figs. 1, 2, 3, and 7, where they are marked N N. They move in guides *n' n'* and punch the fillet which passes between the lower guide and die, *n''*, directly underneath. It is essential to the principle of my invention that these punches should invariably operate alternately, whether the same key be used or different keys. I have accomplished this invariable movement by means of a series of cams carried upon a shaft, J, which is rotated by any one of the key-levers through mechanism hereinafter described. As represented more clearly in Fig. 7 of the drawings, these cams *l l* are formed upon a wheel, L, fixed upon the shaft J. They are in two peripherally-arranged rows, each row being adapted to bear upon an independent lever, M, arranged underneath. The cams in the rows are placed alternately at equal distances asunder, so that as the wheel is revolved a cam operates one of the levers M, and the next succeeding cam, being in the other row, operates

the other. The levers are formed with the offset 1, on which the cam bears until it passes the edge thereof, when the lever is permitted instantly to rise. These levers are pivoted at their front ends upon the case, as shown at *m*. They are slotted at the rear ends and straddle the flattened upper ends of the punches, bearing upon the shoulders, by pressure upon which they force down the said punches. The punches are elevated when the cam has passed the edge of the offset 1 by means of springs O O. These parts are shown in Figs. 1 and 2 as arranged on the outside of the case B, Fig. 2 showing the parts mentioned without the spring-clamp and guide represented in Fig. 1.

Motion is imparted to the shaft J from the key-levers through an oscillating frame, H, pivoted within the case upon the rod *c*, as shown in Figs. 4, 5, and 6. This frame is provided with a flange, *i*, at its rear edge, extending downward and across all the key-levers, and each one of the punch-key levers, (which are marked in the drawings, Fig. 1, C′, C², and C⁴,) when depressed, presses against the lower edge of the said flange, thereby rocking the frame H upon the pivot. The frame is connected to the shaft J by means of an arm, H′, pivoted to ears *i′* on the frame. The upper end of the arm H′ is pivoted to an arm, 2, fixed to a sleeve, I, loose upon the shaft J, but held in place by a collar, 3. This sleeve carries an arm, 4, next to the ratchet K, which is fixed upon the shaft J. A pawl, *k*, is pivoted in the arm 4 and engages with the ratchet K. These parts are accurately fitted, so that when any one of the key-levers bearing against the edge of *i* is depressed it rotates the shaft J a uniform and exact distance, and the parts are so arranged that the movement of the shaft terminates when the edge of one of the cams has just passed the offset 1 upon the lever M. Each key gives to the shaft J precisely the same amount of motion. The frame H is brought down by means of a spring, 5, connecting it to the base of the frame, and the key-levers are kept normally with their front ends elevated by means of the spring P.

The ratchet K may be provided with a suitable pawl for holding it in position, although this is not absolutely necessary, as the offset 1, acting in connection with the cam, serves to prevent any backward movement. A stud, 6, set in the side of the case, limits the movement of the pawl *k*. The key-levers also, when not depressed, rest with their upper edges against cross bar or plate Q, which limits their motion in that direction.

It will be understood from the description which has been given that successive depressions either of the same key-lever or of different key-levers will operate the punches alternately, and cannot operate them in any other way.

It is necessary also to my invention that the key-levers should operate the feed mechanism. To accomplish this I cause the key-levers to extend to the rear, as shown in Figs. 4 and 5. The feed-wheel D (shown in Fig. 2) is fixed upon the shaft *d*, extending through the case, and having its bearings in the sides thereof. Upon this shaft is a sleeve, F, provided with three arms, *e′ e² e³*. The position of these is shown in Fig. 4 and the form more clearly in Fig. 5. They extend toward the front, and bear respectively upon the ends of the key-levers C′, C³, and C⁴. These arms differ in length, as will be observed in Fig. 4, that bearing upon C′ being the longer, that bearing upon C⁴ next in order, and that bearing upon C³ the shortest.

It will be observed by inspection of Fig. 4 that the key-lever C², which is one of those operating the punches, terminates just in rear of the flange *i*, and does not bear against one of the arms of the sleeve F; but it is located by the side of the key-lever C³, which bears against the shortest arm of the sleeve F, and it is made to operate the said sleeve through the medium of the lever C³ by means of a lug, 7, fixed to C³ and extending under C², so that the depression of the latter carries with it the former, and thereby operates the feed. The key C³ does not impinge against the flange *i*, but moves in a notch cut in the said flange, and therefore without lifting the frame H. By this construction the key C³ is caused to operate the feed without operating the punches. Key-lever C² might be extended to act also upon the feed mechanism; but the construction described is the simpler. The relative lengths of the arms *e′ e² e³* are such in this machine that the key-lever C⁴ gives to the sleeve and feed-wheel twice the amount of motion given by C′ and the keys C² and C³ give twice the amount imparted by C⁴. These exact proportions are convenient, but may be varied. In order to secure an exact amount of motion, a stop mechanism is provided for each key-lever. This consists of a stop, *f*, arranged on the sleeve opposite the end of each key-lever. Their form is shown clearly in Fig. 5. The end of the key-lever is shown in that figure as bent downward, and is fitted to abut squarely against the face of the stop *f*, which in each case is adjusted to give the proper amount of movement for each lever. The sleeve communicates motion to the shaft *d*, and thereby to the wheel D, by means of a ratchet, D′, and pawl G′, the latter being adapted to an arm on the sleeve close by the ratchet. The pawl *h*, pressed up by a spring, holds the ratchet in place at the end of each movement.

It will be observed from the description given, and particularly from the illustration in Fig. 5, that direct movement is imparted to the shaft J and the punching mechanism by the depression of the key-levers, but that the same depression gives a reverse movement to the pawl which operates the feed. The direct movement of the pawl G′ is caused by a spring, *g′*, which acts to turn the sleeve F and ratchet D′ at the instant when the pressure upon the key-levers ceases. This causes the feed to take place instantly after the action of the key-levers ceases. Movement is permitted to

the paper strip by the construction of the cams and levers M heretofore described, which operate the punches. As the punches must be withdrawn from the fillet before the feed can take place, a construction is necessary which will permit the punches to retract instantly after the key-levers have reached their lowest limit of movement. This is permitted by the construction heretofore described, the levers M rising as soon as the cam has passed the shoulder *i*, which takes place at the termination of the downward movement of the key-levers, the spring O then instantly drawing up the punch N. At the instant when the pressure upon the key-levers is removed the spring *g'* acts and sets in motion the feed mechanism. The wheel D has a serrated face, and the paper is carried over it in the manner shown in Fig. 2. The pressure-roller E bears against it and the guide S and turns the paper to the rear. The paper passes from the roll on the bobbin over a spring-arm, 9, pivoted on the standard which supports the bobbin, thence under the block which carries the guides for the punches, thence through the slit between the die n^2 and the lower guide, and thence to the feed-roll D. To steady the paper, I have provided a presser-plate, 10, which is pressed by a spring, 11, against the paper as it passes to the die. The spring-arm 9 is in the form of a bell-crank lever, and is held up by another bell-crank lever, 12, and spring 13. A pin in the end of lever 12 bears against the edge of the bobbin-plate and acts as a brake, which is released when the arm is drawn down, but applied when the arm rises.

In Fig. 8 I have represented a fillet as perforated by my apparatus, and in Fig. 9 the record made thereby. The perforations, Fig. 8, representing the letter A, are made by depressing first the lever C', which punches the first hole in the upper line and feeds the smallest space. The second perforation in the lower line is made by depressing the key C^4, which gives a feed double that of the first key. The next perforation is in the upper line, and is made by the key C^2, which perforation records the space between this letter and the next succeeding letter. The next letter represented is B, formed by a perforation made by depressing C^4, then by depressing C' three times, and finally by depressing the space-key C^2, it being understood that C^2 gives the amount of feed necessary for the space between the letters. Spaces between words are formed by depressing C^3 immediately after the depression of the key C^2.

Having thus described my invention, what I claim is—

1. In a perforator, a pair of punches arranged to punch in two lines, a spring for retracting each punch, and mechanism for invariably operating said punches alternately, a key-lever connected to the punch-operating mechanism and also connected to the feed mechanism, whereby upon every depression thereof it operates the punch and retracts the feed mechanism, and means, substantially as described, for moving forward the feed mechanism upon the use of the key-lever, the combination operating as set forth.

2. In a perforator, a pair of punches arranged to punch in two lines, a spring for retracting each punch, and mechanism for invariably operating said punches alternately, a series of key-levers connected with said punch operating mechanism, whereby depression of any one of said key-levers operates a punch and feed mechanism, and a varied connecting mechanism between said feed mechanism and the key-levers, whereby the feed mechanism is retracted a different distance by each key-lever, and means, substantially as described, for moving forward the feed mechanism when a key-lever rises, the combination operating as set forth.

3. In a perforator, a pair of punches arranged to punch in two lines, a spring for retracting each punch, and mechanism for invariably operating said punches alternately, a series of key-levers connected with said punch-operating mechanism, whereby depression of any one of said key-levers operates a punch and feed mechanism, and a varied connecting mechanism between said feed mechanism and the key-levers, whereby the feed mechanism is retracted a different distance by each key-lever, and a feed-key having connection with the feed mechanism only, all the parts being organized and combined as set forth.

4. In a perforator, and in combination, a pair of punches arranged across the path of the fillet-levers M M, provided with offsets 1, a wheel carrying two rows of cams, key-levers, and intermediate mechanism, whereby any one of said key-levers operates said cams, springs to retract the punches, and suitable feed mechanism, substantially as described.

5. The combination of the key-levers, the rocking frame connected to the shaft J, the devices for depressing and retracting the punches, and the sleeve F, provided with arms bearing upon the ends of the key-levers connected to the feed-roller, all substantially as described.

6. The key-lever C^3, adapted to operate the sleeve through the arm *e''*, but not to operate the rocking frame, and the key-lever C^2, adapted to operate the said frame and the key C^3, all substantially as described.

7. The key-levers, constructed as described, in combination with the sleeve F, having arms *e' e²* e^3, and stops *f*, fixed to the sleeve and adapted to come in contact with the ends of the key-levers, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

FRANK ANDERSON.

Witnesses:
RUFUS ANDERSON,
JOHN C. FOSTER.