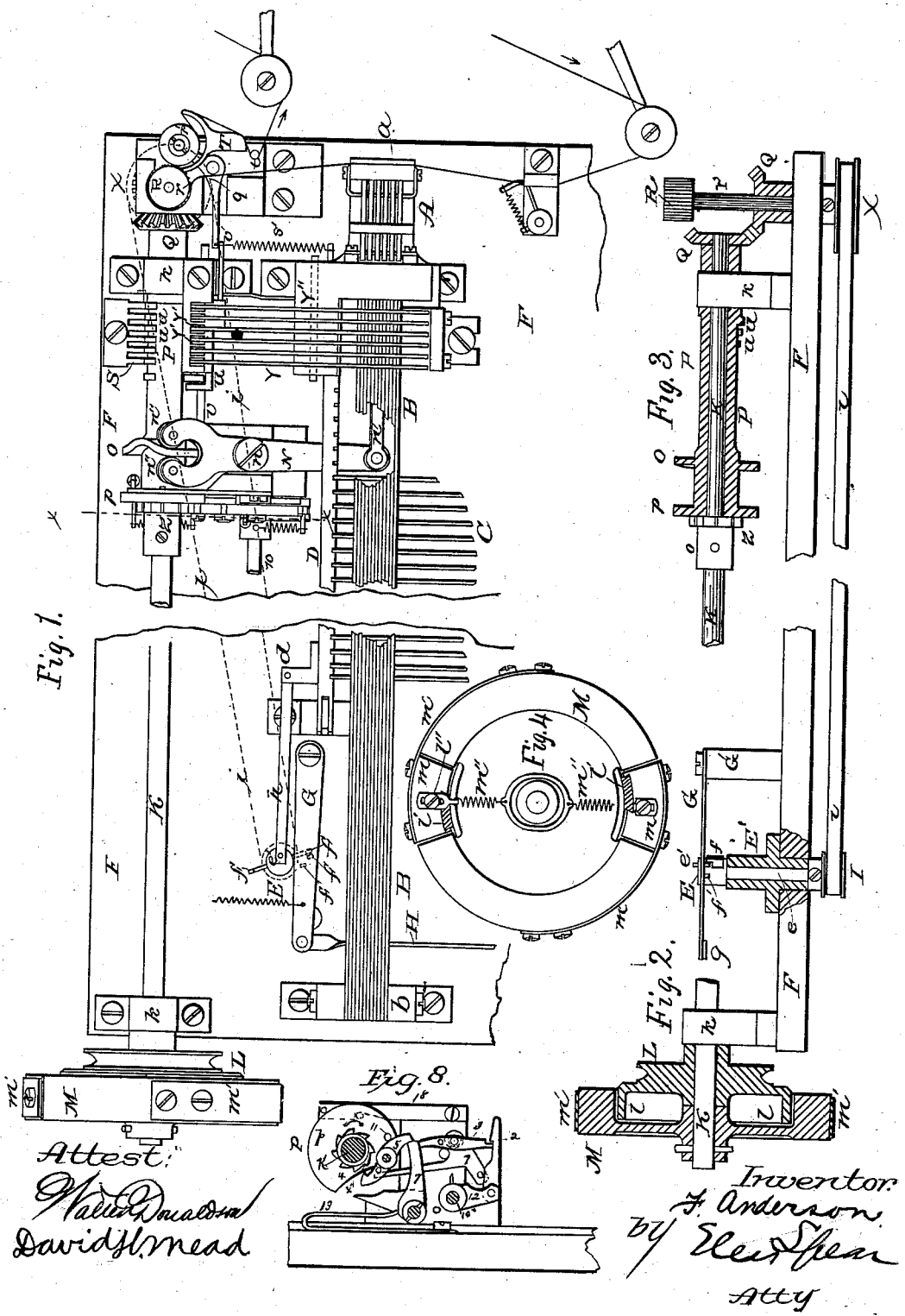
(No Model.)

2 Sheets—Sheet 1.

F. ANDERSON

TELEGRAPHIC PERFORATOR.

No. 265,211. Patented Sept. 26, 1882.



Attest:
Walter Dwight
David H. Mead

Inventor:
F. Anderson
by Elliott Spear
Atty

(No Model.)

2 Sheets—Sheet 2.

F. ANDERSON.

TELEGRAPHIC PERFORATOR.

No. 265,211. Patented Sept. 26, 1882.

Fig. 5.

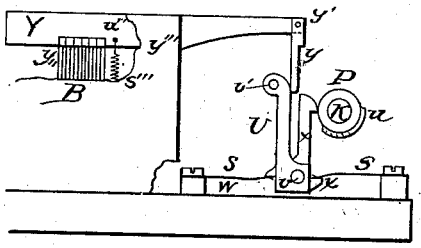


Fig. 6.

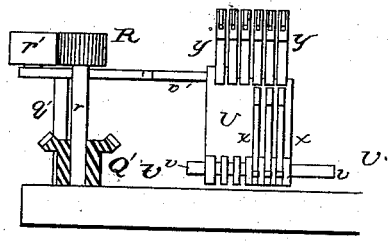
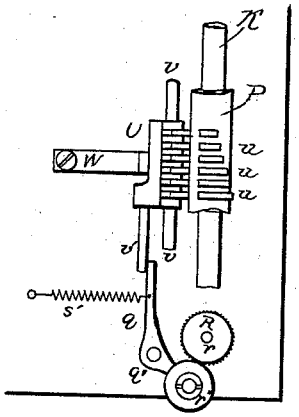


Fig. 7.



Attest
Walter Donaldson
David Dewead.

Inventor.
Frank Anderson
by Elwin 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. 265,211, dated September 26, 1882.

Application filed January 6, 1882. (No model.) Patented in England May 24, 1880, No. 2,114.

To all whom it may concern:

Be it known that I, FRANK ANDERSON, of Peekskill, in the county of Westchester and State of New York, have invented a new and useful Improvement in Telegraphic Perforators; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to mechanism for perforating paper for telegraphic purposes, and is an improvement upon the machine for which Letters Patent of the United States were granted to Frank Anderson and Theodore M. Foote on the 8th day of June, 1880.

My invention consists more particularly of three principal parts, the first of which includes the feeding devices by which the paper fillet is fed to the punching devices. In the patent referred to above these feeding devices have a wholly intermittent motion, moving only with the paper and stopping when the paper is arrested. In my present invention the feeding mechanisms have for the greater part a continuous instead of an intermittent or reciprocating movement, the feed-wheel running constantly, the paper being pressed against it intermittently and moving only when so pressed, this being the essential feature of the first part of the invention.

The second part of my invention consists in utilizing the power which operates the machine, instead of the fingers, to operate also the reversing mechanism, whereby the punches are changed whenever a group of perforations of uneven number is followed by a like group, as fully explained in the patent referred to above.

In connection with these principal features are certain details of construction, all of which are fully described hereinafter, and claimed in connection with the leading features.

The accompanying drawings illustrate the best method known to me for carrying out my invention, showing only as much of the whole machine as is deemed necessary to fully disclose the invention, the other parts not claimed being fully shown in the patent heretofore cited.

In these drawings, Figure 1 is a plan view of that part of the perforator embodying my invention. Fig. 2 is a sectional side view of a portion of the same; Fig. 3, a sectional side view of another part of Fig. 1. Fig. 4 is an elevation of the left-hand end of shaft and fly-wheel. Figs. 5, 6, and 7 represent details, all hereinafter fully explained. Fig. 8 is a transverse section on line *x x* of Fig. 1, showing the connections between shaft and sleeve.

In Fig. 1 of these drawings the punches are represented at A, the permutation-bars at B, the lifting-bars at C, and the reciprocating support for the lifting-bars at D. These parts are the same as those shown in the patent specified; but the support D is operated by different mechanism, as hereinafter explained.

Supported in bearings *k k* in the rear part of the machine is a main shaft, K, through which, instead of the short transverse shaft, as in the said patent, the motive power is transmitted to the various parts of the machine. This shaft carries a sleeve, P, and ratchet-and-clutch mechanism substantially the same as that shown in the patent aforesaid, but varied slightly in form to adapt it to the different location. The connection between the shaft and sleeve is shown in Fig. 1 in connection with other parts, and separately and more in detail in Fig. 8.

It will be borne in mind that in the machine upon which the present invention is an improvement the shaft K revolves continuously by power applied from any convenient source, and that the sleeve through which this power is conveyed to the various mechanisms is intermittently connected with the shaft, making with each connection a complete revolution. In place of the reciprocating latch-bar P in the aforesaid patent, and the bell-crank lever and rod connecting said bar to the rocking frame beneath the key-levers, the locking devices are operated through a rocking shaft, 10, which may extend to the left-hand side of the machine, and by means of an arm and connecting-rod be attached to a like arm on the shaft of the rocking frame, receiving proper motion from the key-levers. The disk *p* in this machine (corresponding to that marked H in the said patent) is fixed to the sleeve and carries the pawl 5, by means of which it is intermittently connected to the ratchet 4, fixed to the shaft K. The pawl is drawn into connection with the ratchet by means of a spring, and the shaft revolves, as indicated by the arrow. When thus connected the shaft will carry the

disk and sleeve with itself until in its revolution the bent end of the pawl 5 strikes the upper end of the pivoted stop 7. This throws the pawl out of gear with ratchet 4, the disk is arrested by the pin 11 bearing against the pawl, and the shaft continues its revolution, while the disk and sleeve are held locked by the yielding spring-catch S. The stop 7 is held in position to arrest the pawl by means of the bar 3, pivoted on the frame and extending to the front sufficiently to engage with an arm, 2, notched to fit the end thereof, and pivoted upon a fixed arm, 12, on the shaft 10. Arm 2 is drawn forward by means of a spring into engagement with the end of bar 3, and is thrown back by means of a bent stop, 1, the front end of which bears against the arm 2, and the rear end is in the path of the disk *p*. When the disk is arrested and locked this rear end is thrown up into the recess *x'* in the disk by the spring 13; but the revolution of the disk throws it out, pushing the arm out of connection with bar 3. Upon depression of a key-lever the shaft 10 is rocked and the arm 2 drawn down, tipping the bar 3, releasing stop 7, permitting its spring to throw the pawl into connection and the disk to move. As it moves it rocks lever 1, releases bar 3, throws forward stop 7, and thereby sets it again, the rear end of the bent stop being moved by means of the spring 13 into the recess *x'* in the disk. By this mechanism, as by that in the said patent, the sleeve is carried, on each depression of a key-lever, one revolution.

Upon the sleeve P is a cam, O, which, by means of the bifurcated lever N, rollers *n'' n''*, and link *n'*, imparts motion to the punches.

At the end of the machine, near the punches, is the feed-wheel R, Figs. 3, 4, 6, and 7, supported on the vertical shaft *r*, which extends down through the base, as shown more clearly in Fig. 3. The shaft K and this shaft *r* are geared together by the pair of bevel-wheels Q Q, so that the feed-wheel R runs with the shaft. The wheel R is nearly inclosed in a circular chamber, (shown in Fig. 1,) which is only enough larger than the wheel to permit the paper to lie freely in it and about the wheel. The wheel is slightly grooved or corrugated longitudinally. Adjacent to the wheel R is the idle pressure-roller *r'*, Fig. 7, supported by the lever *q*, which vibrates on pivot *q'*, Figs. 1, 6, and 7. The roller *r'* is not necessarily idle, as it might be geared with R, so as to keep up its motion, whether against R or not, loose gear allowing enough motion in the slight separation of the two rollers required. Although the gear would be a convenient device, it is not necessary in this case. A spring, S', attached to the lever *q*, tends to keep the roller *r'* in contact with the wheel R. The paper will lie motionless in the channel about R so long as the rollers R and *r'* do not touch; but if they are brought together the paper instantly moves and continues to move so long as contact continues, but stops instantly when the rollers are separated. It only remains therefore to regulate the length of contact to get the variable feed. For this purpose the sleeve P is provided with a series of cams, *u u u*, Figs. 5 and 7, corresponding in number to the number of variations required.

Pivoted on an axis, V, which lies parallel to K, is the plate or apron U, Figs. 1, 5, 6, and 7. This plate stands vertically, and is free to vibrate in front of the cams *u u u*. A projecting arm, *v'*, on this plate, Figs. 1, 6, and 7, engages with the end of lever *q*, Fig. 7, and directly holds the roller *r'* away from the wheel R. A spring, W, Figs. 5 and 7, tends to force the apron U toward the cams. This spring is much stronger than the spring S', and overcomes it and keeps the rollers R *r'* separated.

Resting freely in slots, Figs. 5 and 6, in the apron U, and pivoted on same axis, are the levers *x*, the upper ends of which lie in the path of the cams *u u*, and these levers are kept against the cam-sleeve by the light springs S, Figs. 1 and 5.

It will be understood that the cam-bearing sleeve P makes one complete revolution every time a key is depressed. The levers *x* therefore will be forced back toward the apron at every depression of a key by the cams *u*, and will remain in such position a length of time corresponding to the length of the cams, the cams being of different lengths. If, while the parts are in the position of Fig. 5, we insert a wedge or plug between *x* and U, then when *x* is forced back the apron will be forced back also, and stay back so long as the cam acts, and while U is back the lever *q* is liberated, and the spring S' is free to bring about contact between the wheel R and roller *r'*, thereby moving the paper the distance moved corresponding to the length of the particular cam which the plug causes to act.

In Fig. 5, *y* represents the pendent piece or plug, pivoted at *y'* to a bar or lever, Y, in turn pivoted at *y'''*, Figs. 1 and 5. The bar Y extends over the tops of the permutation-bars B, Figs. 1 and 5. One of these bars is provided for each length of feed, and they are so placed that one of the pendent pieces *y* lies, when at rest, above and just clear of the spaces between levers *x* and apron U, Figs. 5 and 6; but when a key is depressed the permutation-bars B will be raised, carrying with them the bars Y and pushing the pendants *y* down between U and *x*. The bars Y are notched at *y''*, where they rest on the bars B, so that only the required ones may be acted upon. A light spring, *s'''*, keeps the bars in place when at rest. If the letter "E," consisting of one dot, were being made, one bar B would be raised, and all the bars Y would be notched where they cross, except one, so that only the pendant corresponding to the shortest cam would be operated. The second length of feed would be operated only by the second permutation-bar, and so on. As the feed-wheel R and the sleeve or shaft are geared together, the same relation will always exist between the movement of the cam and the roller R, whether the machine be run

fast or slow. The piece T, Fig. 1, guides the paper away from the rollers. The paper is passed around the pin *t* on its way to the winding-reel, in order that the several angles the paper has to make may prevent the reel pulling the paper through the machine. The shaft of the feed-wheel extends through the base and carries a pulley, X, that operates by a belt the reversing device for bringing about the alternation in position of perforation required, as set forth in the before-mentioned patent.

E, Figs. 1 and 2, is a small disk on the upper end of the small shaft *e*, which is supported in standard E′, Fig. 2, and has on its lower end, under the base the, pulley I, connected by belt *i* with X. The belt is not so tight but that it may slip if the disk E is not perfectly free to turn. The disk E has on its upper face a small crank-pin, *e′*, with a throw of about an eighth of an inch. This pin is connected to the reciprocating bar D by the link *h* and pivot *d*. It is evident, now, that if the disk E is allowed to revolve the bar D will move backward and forward, carrying the series of lifting-bars with it. The pulleys X and I are so proportioned as to give I a rapid motion.

To prevent the continuous action of the bar D, the disk E is provided with arms or wings *f f*, that engage alternately with the pins *f′ f′*, lying in the path of the wings, and prevent the rotation of disk E, except when the lever G, which carries the pins, is vibrated. Each vibration of the lever G (which, in connection with the wings, acts as an escapement) allows the disk to make a half-revolution. This escapement is connected by means of the rod H and a swinging frame with certain of the keys, so as to act only as desired. The frame to which the rod H is connected is the same as that shown in the patent heretofore referred to, the difference in action between the two mechanisms being that the swinging of the frame in the patent caused the swing-frame to shift the levers for effecting a change when an uneven number of punches had been used, as therein explained. In this mechanism, as will be apparent from the description, the change is effected by the driving-power acting through the intermediate mechanism on the bar D, the power applied by the finger serving only to release the wings *f f* and permit the power to act. The relations of the wings *f f* and crank-pins *e′* are such that the pin stops when it is in a line with center of E and pivot *d*, or on its dead-center, the result of which is that the bar D will stand at the extreme right or left of its limit of movement.

The governor is of special construction, which construction is particularly described in an application filed by me in the United States Patent Office of even date herewith. It consists of a fly-wheel, M, fixed on the main shaft K, and provided with sections which are pressed by springs regulated in force upon the rim of a driving-pulley running, when not so pressed, free on the shaft K. The fly-wheel is made with the web well to one side, leaving a recess in the other to receive the rim of the pulley L. The sections are provided with light springs *m′*, attached to the segments at one end and at the other to the rim of the fly-wheel, and regulating-springs *m″*, which tend to press the segments on the said pulley and hold it to the fly-wheel, so that the shaft is driven up to a certain determined speed. At that point the centrifugal force causes the segments to release their pressure on the rim of the pulley, leaving it to run free until the slacked speed of the main shaft causes them again to press upon the rim. By means of this governor the movement of the perforator is regulated and the labor of the operator lessened.

Having thus described my invention, what I claim is—

1. In a perforator, a continuously-running feed-wheel connected to the main driving-shaft of the machine, and combined with means, substantially as described, acting in connection with the key-levers, for pressing the paper intermittently upon said wheel.

2. The combination of the feed-wheel R, connected to the main shaft and adapted to run continuously therewith, with the pressure-roller *r′*, adapted to be pressed intermittently against the feed-wheel and to cause the same to act upon the paper strip, as set forth.

3. The combination of the feed-wheel R, connected to the main shaft and running continuously therewith, a pressure device adapted to press the paper strip intermittently against said wheel, mechanism, substantially as described, connected to the main shaft, for determining the length of time of pressure against said wheel, and devices controlled by the key-levers for throwing said mechanism into connection with the pressure device, as set forth.

4. The sleeve P, provided with cams *u u u*, apron U, having arm *v′*, engaging with spring and lever of pressure-roller, the spring W, lever *x*, and plugs *y*, all combined with each other and with the bars Y and key-levers, as set forth.

5. The combination of the wheel R and its inclosing chamber, pressure-roller *r′*, operated as described, and guide-piece T, substantially as described.

6. The sleeve P, loose upon the shaft K, and provided with mechanism for connection therewith, substantially as described, bevel-gears Q Q, shaft *r*, and feed-wheel moving with said shaft, in combination with the pressure-roller operating in connection therewith, as set forth.

7. In a perforator of substantially the form described, a series of lifting-bars, shifting mechanism for the same, driven from the main driving-wheel of the machine and running constantly therewith, a frame rocked by key-levers which cause groups of perforations of uneven number, and mechanism between said frame and the shifting mechanism, whereby upon depression of any one of said keys the

shifting mechanism is thrown into connection with the lifting-bars, and said bars are shifted by power derived from the main driving-wheel, substantially as described.

8. In the described perforator, the shifting bar D, connected to disk E, in combination with the pulleys and connecting-belt, and an escapement operated by the key-levers, substantially as described.

9. In combination with disk E, operating the shifting bar D by connection with main driving mechanism, the wings *f f*, pins *f' f'*, lever G, and devices connecting the lever to the key-levers, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK ANDERSON.

Witnesses:
JOHN C. FOSTER,
WALTER DONALDSON.