

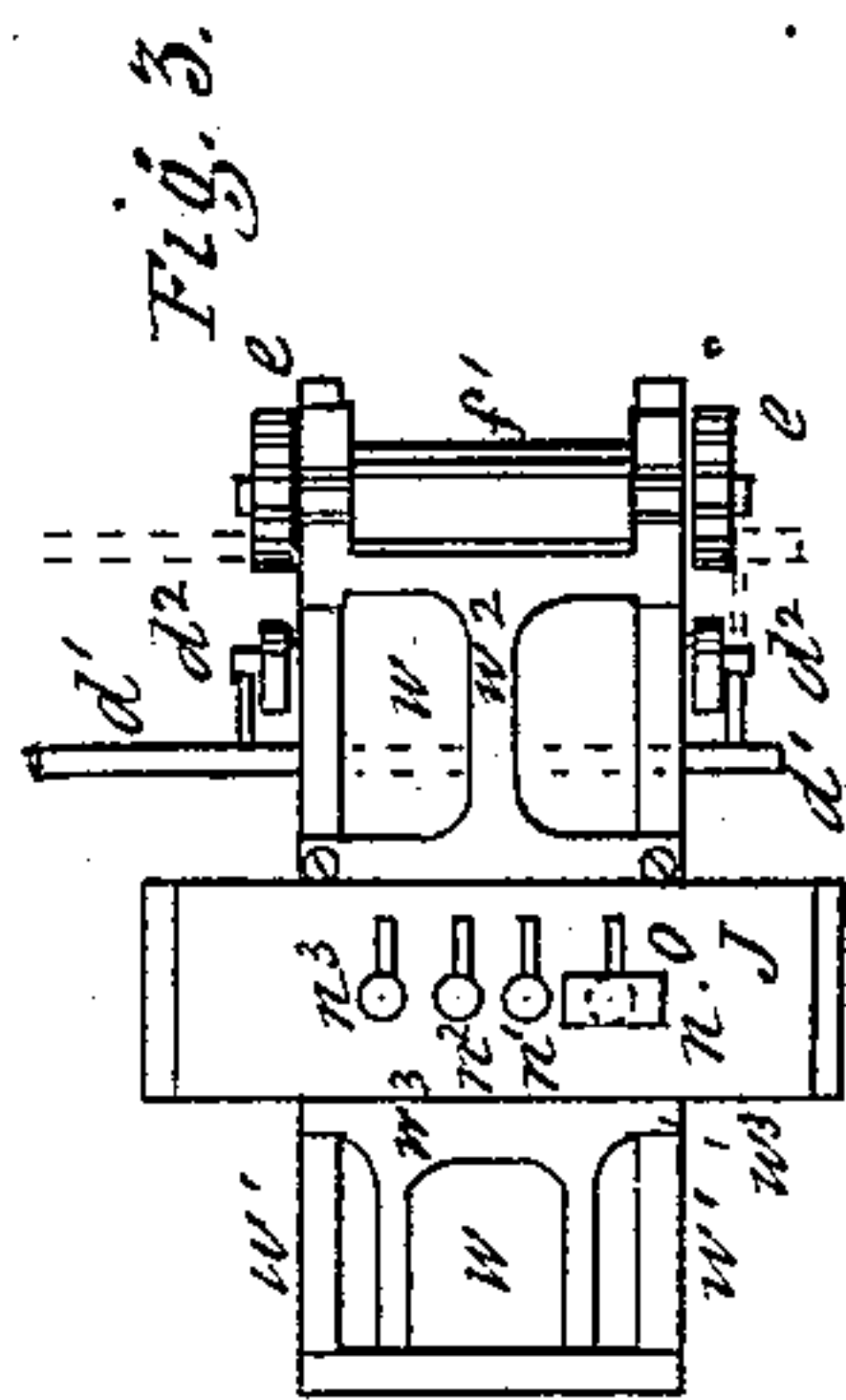
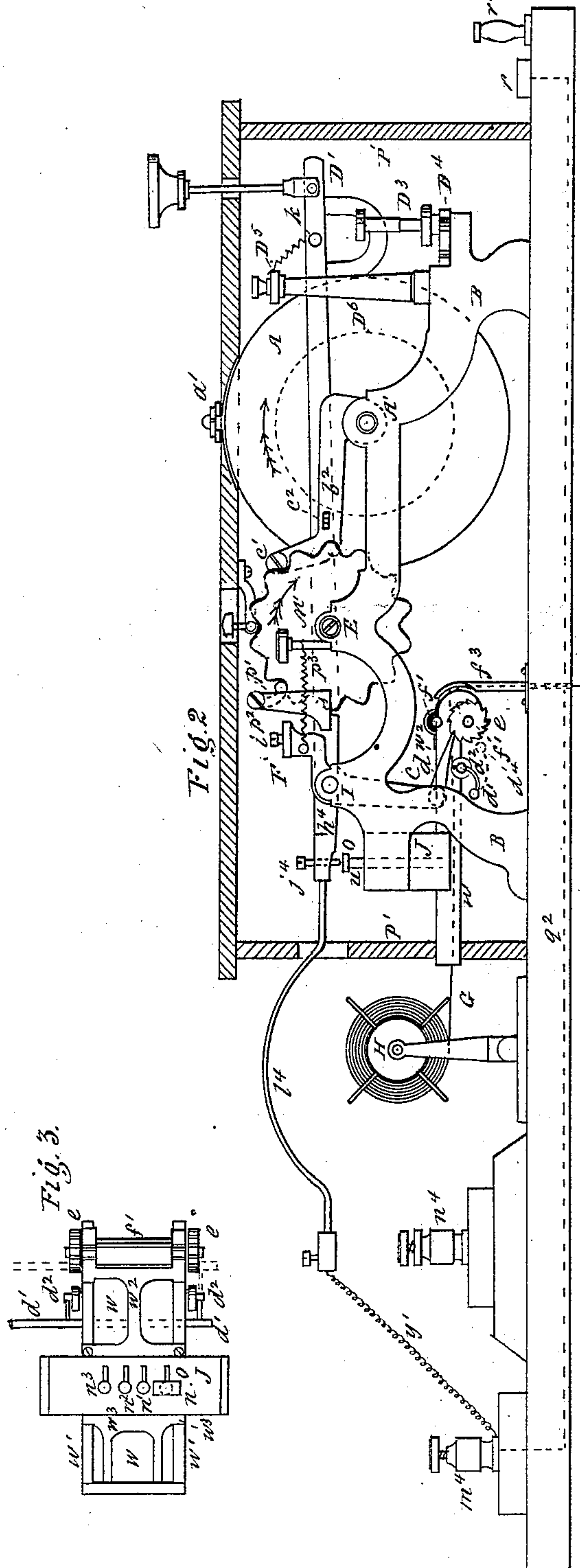
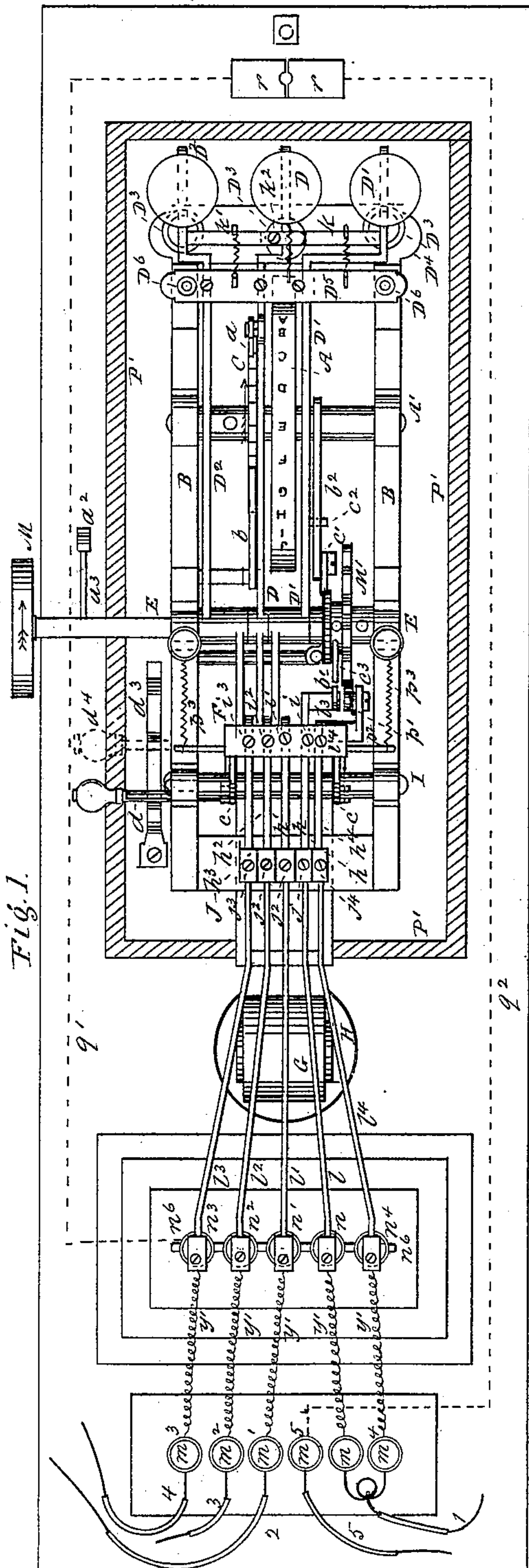
(No Model.)

2 Sheets—Sheet 1.

A. F. & F. B. JOHNSON.
INSTRUMENT FOR PREPARING AND TRANSMITTING SECRET TELEGRAPH
MESSAGES.

No. 253,064.

Patented Jan. 31, 1882.



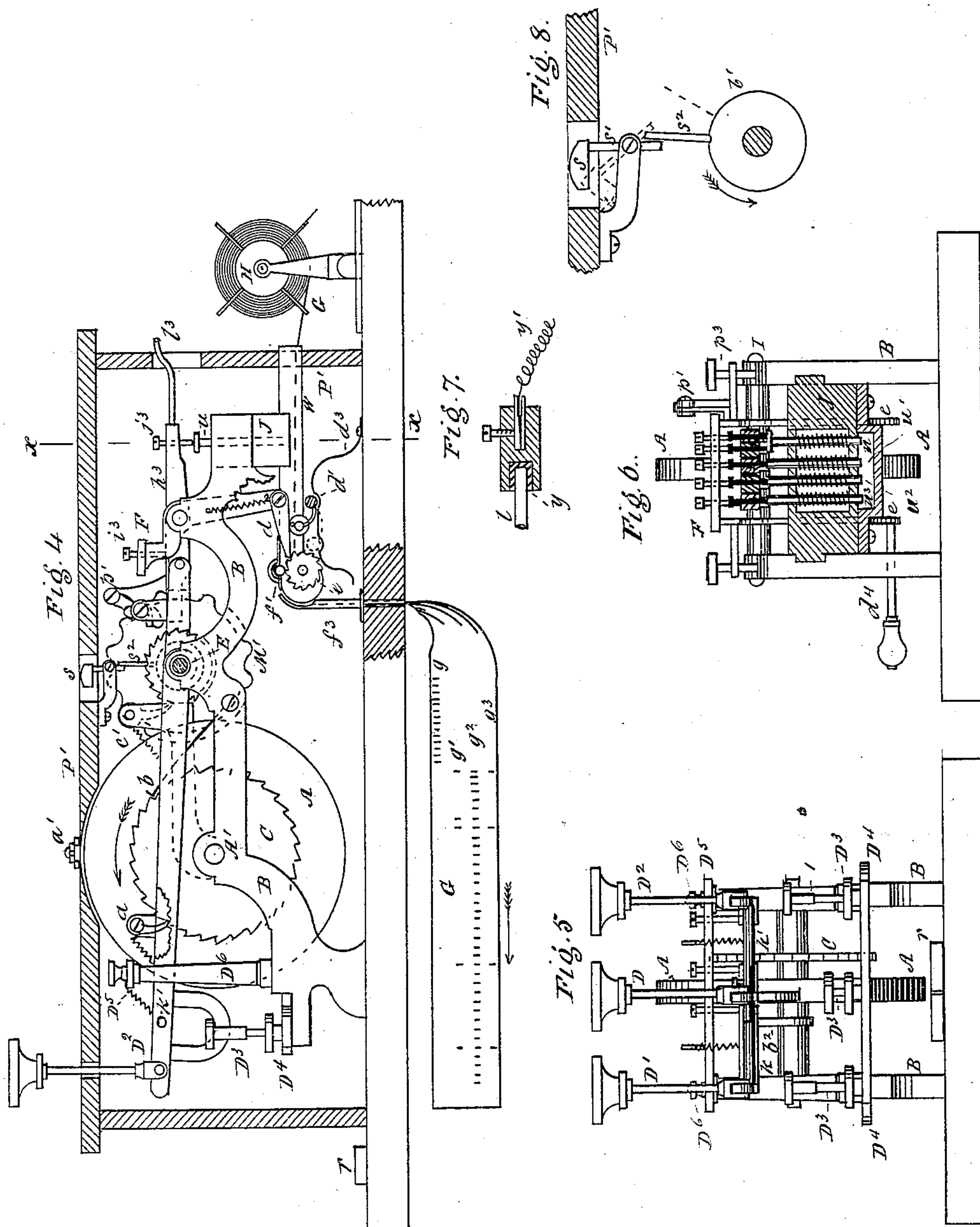
Witnesses:
Jno. J. Gleason
A. Fred. Silverstone

Inventors:
Albert F. Johnson,
Frank B. Johnson,
By their atty, John B. Thomson

2 Sheets—Sheet 2.

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Inventors:
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UNITED STATES PATENT OFFICE.

ALBERT F. JOHNSON AND FRANK B. JOHNSON, OF BROOKLYN, NEW YORK,
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PLACE.

INSTRUMENT FOR PREPARING AND TRANSMITTING SECRET TELEGRAPH-MESSAGES.

SPECIFICATION forming part of Letters Patent No. 253,064, dated January 31, 1882.

Application filed November 8, 1881. (No model.)

To all whom it may concern:

Be it known that we, ALBERT F. JOHNSON and FRANK B. JOHNSON, citizens of the United States, residing in the city of Brooklyn, in the county of Kings and State of New York, have invented an Improved Instrument for Preparing and Transmitting Secret Telegraphic Dispatches; and we hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, in two sheets, which form a part of this specification.

This invention relates to improvements in mechanism for transmitting secret telegraphic messages or dispatches, and is designed to be used in connection with our improved system of transmitting secret messages by electric-telegraph instruments set forth in our specification marked "A," filed August 16, 1881.

The object of this invention is to construct an instrument in such a manner that it will serve three different purposes—namely, to operate the mechanism of a receiving-instrument at a distant station through the medium of electric impulses by means of a letter-wheel corresponding with the printing-wheel of said receiving-instrument, and a series of levers and circuit-closers operating conjointly to cause the receiving-instrument to receive the message and print the same in ordinary alphabetical characters; also, to make a copy of such message as it is being thus transmitted by means of indentations made on a strip of paper; and also to prepare a message without transmitting it directly, which said prepared message may be transmitted at any future time by means of a suitable transmitting-instrument, the said preparation of the message consisting in forming upon a strip of paper a number of series or lines of indentations, which, when passed through such transmitting-instrument, will each bring into circuit a separate electro-magnet on the receiving-instrument, and thereby operate the latter automatically to receive and print the message in alphabetical characters.

The nature of the invention consists in certain novel constructions and combinations of mechanism, hereinafter specifically described,

whereby we are enabled to carry into effect the said several objects.

In the accompanying drawings, on Sheet No. 1, Figure 1 is a plan view of the instrument; Fig. 2, a side elevation of the same; and Fig. 3 a detail view, hereinafter explained; and on Sheet No. 2, Fig. 4 is an elevation of the side opposite that shown in Fig. 2; Fig. 5, an elevation of the rear end of the instrument; Fig. 6, a transverse section on the line *xx*; and Figs. 7 and 8 are detail views, hereinafter explained.

Similar letters of reference indicate the same parts in all the several figures wherever they occur.

We shall first describe the mechanism for indenting the message on a strip of paper, as above mentioned, and we may here state that the receiving-instrument to be used in connection with the instrument herein described is constructed to print the message in consecutive transverse lines upon a strip of paper fed longitudinally through the said receiving-instrument.

A is a letter-wheel, consisting of a plain disk having a flange on its periphery, upon which are marked the letters of the alphabet and punctuation-characters, which correspond in kind and in the order in which they are placed with the letters and characters on the printing-wheel of the receiving-instrument used in connection with the instrument herein described. This wheel A is secured upon a shaft, A', which has bearings in the frame B of the machine. Upon the said shaft A' is also secured a ratchet-wheel, C, having teeth equal in number to the characters on the letter-wheel A, and which is rotated by a pawl, *a*, pivoted on a lever, D, which latter is fulcrumed on a transverse bar, E, so that each time the lever D is depressed the letter wheel is rotated the space between two of the adjoining characters marked thereon.

b is a pawl to prevent the wheel C from running back.

F is an oscillating frame pivoted on a bar or shaft, I, and having two downwardly-projecting arms, *c c*, one at each side, at the lower ends of which are pivoted pawls *d d*, which rotate ratchet-wheels *e e*, secured at each end of

a feed-roller, f , whenever the frame F is raised. The frame is raised each time the lever D is depressed through the medium of a lever, h^2 , and a pin or set-screw, i^2 , the said lever h^2 being fulcrumed on the bar I , and pivoted at its rear end to the front end of the lever D , and the said pin or set-screw i^2 being passed through the frame F , so that its lower end rests upon the rear end of the lever h^2 , so that each time the lever D is depressed and the rear end of the lever h^2 correspondingly raised the frame F is also raised and the pawls d rotate the ratchet-wheels e the space of one tooth, and thereby feed forward the strip of paper G upon which the indentations are made. From this it will be apparent that whenever the lever D is depressed the letter-wheel A is rotated the space between two adjoining characters on the same, and also that the strip G is simultaneously fed forward. The strip G passes from a reel, H , secured at any convenient point over a plate, w , and thence between the feed-rollers f and f' . At each side of the plate w are flanges w' w' , between which the strip passes, and the upper feed-roller, f' , is journaled in grooves formed in these flanges, and is held in contact with the lower feed-roller, f , by means of a spring-plate, w^2 , secured to the flanges w' w' over the plate w , which plate w^2 also serves to guide the strip G to the feed-rollers. The rollers f and f' are provided with friction-surfaces of rubber or other suitable material so that they will not slip on the paper. w^3 is another spring-plate for the purpose of keeping the strip G in contact with the plate w as it passes underneath a series of punching-rods, u u' u^2 u^3 , by means of which the indentations are made on the strip G . The rods u u' u^2 u^3 pass vertically through a box, J , directly under the front ends of the levers h' h^2 h^3 , and the rod u under the levers h and h^4 , and are depressed thereby respectively to make indentations on the strip G as it is passed underneath them over the plate w , and when at rest are lifted from the strip G by means of spiral springs placed in an opening in the box J , as shown in Fig. 6.

Fig. 3 represents a plan view of the feeding and punching devices above described. Each of the punching-rods makes a separate line or series of indentations, as follows: The rod u^2 is depressed by the lever D and makes an indentation each time the said lever is depressed, and at the same time the strip G is fed forward, as above described. The rod u^3 is depressed each time the lever D^2 is depressed, which latter is fulcrumed in the bar E , and at its front end is pivoted to the rear end of a lever, h^3 , which is fulcrumed on the bar I , and a set-screw, i^3 , which passes through the frame F , rests on its rear end, so that the said frame F is raised and the strip fed forward whenever the rod u^3 makes an indentation. The rod u' is depressed by means of the lever D' , which also is fulcrumed on the bar E and pivoted at

its front end to the rear end of a lever, h' , fulcrumed on the bar I , and a set-screw, i' , passing through the frame F , rests upon the rear end of the lever h' , so that the frame is raised each time the lever D' is depressed, and the strip G fed forward each time said rod u' makes an indentation.

The rod u is depressed by two independent levers, h and h^4 , both of which are fulcrumed on the bar I and operate independently of each other, as will presently be described; and set-screws i and i^4 , passing through the frame F , rest upon the rear ends, so that whenever their front ends are depressed the said frame is raised and the strip G fed forward, as before. Whenever, therefore, an indentation is made on the strip G it is fed forward, and each rod makes a separate and distinct line or series of indentations, u^2 making indentations on the line g^2 , u^3 on the line g^3 , and u' on the line g' ; and when the strip G is passed through the transmitting-machine the several lines or series of indentations automatically operate separate circuit-closers, by means of which the several electromagnets on the receiving-instrument are brought into circuit, and by means of suitable mechanism operate said receiving-instrument, the indentations g^2 each bringing into circuit the magnet which rotates the printing-wheel, so that it is caused to precisely repeat the movements made by the letter-wheel while these indentations were being made, the indentations g' bringing into circuit the magnet which effects the transverse movement of the printing-wheel, so as to leave proper spaces between the letters and words on the strip in the receiving-instrument upon which the message is printed, and the indentations g^3 bringing into circuit the magnet which causes the impressing-roller to press the said strip against the printing-wheel, so as to receive the impression thereof whenever the proper letter has been brought into position by the indentations g^2 . As above mentioned, the rod u makes indentations g , and these, when passed through the transmitting-instrument, bring into circuit the magnet that operates the longitudinal feed of the message-strip in the receiving-instrument. This rod u is depressed by both of the levers h and h^4 , and is provided at its upper end with a plate or cap, o , upon which the set-screws j and j^4 at the front ends of said levers strike when they are depressed.

The lever h is operated automatically by mechanism consisting of the following parts: b' is a ratchet-wheel fitted loosely upon the shaft or bar E , and having teeth equal in number to the number of letter-spaces in each transverse line of printing on the message-strip in the receiving-instrument. b^2 is an arm, pivoted at its rear end to the shaft A' , and having pivoted at its front end a pawl, c' , which rotates the ratchet-wheel b' . This arm is operated by the lever D' by means of a pin, c^2 , fixed on the side of the latter, which works in a slot formed in the arm b^2 , so that whenever the lever D' is depressed

the front end of said arm is also depressed and causes the pawl c' to rotate the wheel b' the space of one tooth. A pin, c^3 , is fixed on the hub of the wheel b' , which, at each revolution of the said wheel, strikes a pawl or projection, b^3 , on the rear end of the lever h , so as to lift the same and correspondingly depress its front end, so that an indentation, g , is made by the rod u . When, therefore, the lever D' has been depressed a sufficient number of times to cause a complete revolution of the wheel b' , through the medium of the pawl c' , one of these indentations g is made, and the said indentation, when passed through the transmitting-instrument, causes the longitudinal movement of the message-strip in the receiving-instrument the space between lines of printing thereon, so that by means of the indentations thus made the message-strip is moved forward at the end of each line of printing thereon.

The lever h^4 is operated by hand to make indentations g , for the purpose of moving forward the strip on the receiving-instrument to leave a convenient space between the subject-matter of the message and the address, and again between the latter and the commencement of the next message to be printed upon said strip. It is operated by means of the following-described mechanism. M is a hand wheel or crank fixed upon the shaft E , and M' a toothed wheel, also fixed upon the same shaft and rotated by said hand-wheel. A click or detent, p' , secured upon a bar, p^2 , which is attached to the rear end of the lever h^4 , falls between the teeth of the wheel M' , so that the rear end of the said lever h^4 is raised and its front end depressed as each tooth of said wheel M passes the said click, and the rod u makes one of the indentations g .

The frame F , in its normal position, is held by means of the springs $p^3 p^3$, with each of the set-screws $i i' i^2 i^3 i^4$ resting upon the rear ends of the levers $h h' h^2 h^3 h^4$ respectively, and whenever the rear end of any of the latter is raised the said frame is thereby also raised, and the lower ends of the arms e thrown back so as to cause the pawls $d d'$ to rotate the feed-rollers $f f'$, and thus feed forward the strip G each time an indentation is made by any one of the punching-rods. The indented end of the strip G , after it has passed between the feed-rollers, is guided through an opening in the platform of the machine, as shown in Fig. 4, by means of an upright plate, f^3 .

The instrument is inclosed in a cover or case, P' , which in the drawings is shown in section. Each of the levers $D D' D^2$ is provided with a knob for convenience in operating it, which said knobs are fixed on the upper ends of rods which pass through the top of the case, and at their lower ends are pivoted to the rear ends of the respective levers, as shown. Under the rear ends of said levers are set-screws D^3 , secured on a transverse bar, D^4 , for adjusting the throw of said levers, and the rear ends of said levers are suspended by springs secured

to a bar, D^5 , which latter is supported by pillars D^6 , fixed on the frame B . Set-screws passing through said bar D^5 determine the upward throw of the rear ends of said levers.

k is a pin or transverse rod, secured at one end to the rear end of the lever D' , its other end passing directly underneath a similar rod, k' , secured to the lever D^2 , so that while the lever D' is free to move independently of the lever D^2 it is depressed every time the lever D^2 is depressed, and consequently whenever one of the indentations g^3 is made one of the indentations g' is made simultaneously therewith; but the latter may be made without making the former.

k^2 is a set-screw for adjusting the relative throw of these two levers.

The throw of the front ends of the levers $h h' h^2 h^3 h^4$, so as to cause the punching-rods to make deeper or shallower indentations, is adjusted by means of the set-screws $j j' j^2 j^3 j^4$, which pass through the front ends of said levers and rest upon the upper ends of said rods. The pawls or clicks b^3 and p' are also made adjustable.

For the purpose of insuring regularity in the transverse movement of the printing-wheel of the receiving-instrument, so that it shall be in position to commence the message at the beginning of a line, we employ the devices shown in Fig. 8, in which s is a movable index fixed on the upper end of a rod, s' , pivoted immediately under an opening in the top of the case P' , and a pin or rod, s^2 , is fixed in the hub of the wheel b' in such position that its upper end will strike the lower end of the rod s' the moment the pin c^3 (hereinbefore mentioned) passes the pawl b^3 , which, as previously stated, makes an indentation to move the message-strip forward at the end of each line of printing thereon. When the pin s^2 strikes the end of the rod s' the index is raised into the opening in the cover, as shown, and it is arranged so that s^2 and s' shall be disengaged, so as to allow the index to fall before the next tooth of the wheel b' comes directly under the rod s' . By this means the position of the printing-wheel is determined at the commencement of a message, it being understood that automatic mechanism is provided on the receiving instrument to run back the printing-wheel at the end of each line into position to commence another line.

The operation in indenting a message is as follows: The letter-wheel A is set with the last of the series of characters thereon immediately under an index, a' , located above an opening at the top of the case, through which each character is seen as it comes under said index, and a pointer, a^2 , fixed upon a rod, a^2 , on shaft E , is brought directly underneath another opening provided at the top of the case, and the index s is also brought into the position shown in Fig. 8. The instrument is then in position to commence to indent a message, after which, to indent the message, the letter-wheel is rotated by depressing the lever D a sufficient

number of times to bring the first letter in the message under the index a' , and thereby a number of the indentations on the line g^2 are made, for the purpose of making a corresponding movement of the printing-wheel when the message is transmitted; and when the required letter has thus been brought under the index the lever D^2 is depressed, which also depresses the lever D' , and thus two indentations are made on the strip, one of them on the line g' and the other on the line g^3 . The letter-wheel is then again rotated until the next letter in the message comes under the index a' , and then the lever D^2 is again depressed, and so on to the end of the first word. At the end of each word the lever D' is depressed separately, making one of the indentations g' for the purpose of leaving a space in the printed message between the end of the first word and the beginning of the second. These several manipulations are repeated until the end of the message is reached, the rod u meanwhile being automatically operated to make an indentation at each revolution of the wheel b' , for the purpose hereinbefore mentioned. At the end of the subject-matter of the message the wheel M' is turned one complete revolution by hand, making indentations g equal in number to the number of its teeth, for the purpose of feeding forward the printed strip in the receiving-instrument to leave a suitable space between the message and the address; and before the next message is indented this wheel is turned another revolution to make indentations for the purpose of feeding forward the strip in the receiving-instrument into position to receive the next message.

We now proceed to describe the mechanism for transmitting a message direct without first indenting it upon the strip of paper. For this purpose all the mechanism above described is used, except the strip G and the mechanism for feeding it through the machine. The punching-rods above described remain in the same position as before, but do not operate to make indentations, as the paper is not fed through the machine, the pawls d being thrown out of contact with the ratchets e by means of the rod d' and eccentric d^2 . This rod d' is connected with the said eccentric d^2 and travels on a spring-bar, d^3 , having two recesses for holding it, and when in the position shown by the full lines in Figs. 1, 2, and 4 the pawls d are in gear with the ratchets e , and when brought into the position shown by the dotted lines d^4 the eccentric lifts the pawls d , so that they do not engage with the ratchets.

m m' m^2 m^3 m^4 m^5 represent a series of six binding-posts, which are insulated from the platform upon which they stand and from each other, excepting m and m^4 , which are connected, and n n' n^2 n^3 n^4 are a series of five binding-posts, which are insulated from the platform on which they stand, but are connected with each other by wire n^6 . l l' l^2 l^3 l^4 are a series of five rods fixed respectively to

the ends of the levers h h' h^2 h^3 h^4 , which latter are provided with metal knobs at their outer ends, which make contact with the posts n n' n^2 n^3 n^4 whenever the levers to which they are attached are depressed. The knobs are insulated from the rods by a packing of non-conducting material, (shown at y in Fig. 7,) and a thin copper wire, y' , extends from each to one of the posts m m' m^2 m^3 m^4 , by which means the post with which such wire is connected is connected with the post with which the knob carrying such wire comes in contact. A wire, q' , connects the posts n n' n^2 n^3 n^4 with one section of a switch, r , and a wire, q^2 , connects the post m^5 with the other section of said switch r , and whenever the instrument is to be used for sending a message direct a metallic plug, r' , is inserted into a hole in the said switch, so as to connect the two sections thereof. A wire, 5 , connects the post m^5 with the positive pole of an ordinary battery, (not shown in the drawings,) the negative pole of the said battery being connected by wire with the earth, and the posts m m^4 m' m^2 m^3 m^4 are connected by line-wires with the magnets on the receiving-instrument, m and m^4 being thus connected by wire 1 with the magnet that operates the longitudinal feed of the message-strip, m' by wire 2 with the magnet that operates the transverse feed of the same, m^2 by wire 3, that effects the rotary movement of the printing-wheel, and m^3 by wire 4 with the magnet that operates the impressing-roller in the receiving-instrument, and these several magnets are each connected to the negative pole of a battery at the receiving-station, the positive pole of which is connected by wire with the earth. It will therefore be seen that whenever one of the levers l makes contact with one of the posts n the post to which its wire y' is attached brings into circuit the magnet with which it is connected by its line-wire, and consequently by depressing the levers h h' h^2 h^3 h^4 the several magnets are brought into circuit and automatically operate the receiving-instrument, and in order to send a message direct the instrument herein described is manipulated in precisely the same manner as it is manipulated to indent a message, and it is not deemed necessary to repeat the description of said manipulations.

In order to carry into effect the third object of our invention—namely, to make a copy of the message as it is being transmitted—both sets of mechanism above described are operated simultaneously. This is done by throwing the ratchets e into gear by the rod d' , so that the strip G is fed through the instrument while the message is being transmitted direct, and receives the indentations in the manner before set forth. A copy in the form of an indented strip is thus obtained, which can be preserved for future use.

We may state, in conclusion, that we do not confine ourselves to indentations of any particular form, nor to indentations exclusively as

a means of preserving a copy of the dispatch, as other marks or characters may be used for that purpose, the object being to preserve the copy in a form that shall be unintelligible upon inspection, but that will operate the receiving-instrument automatically when passed through a properly-constructed transmitter connected with such receiving-instrument by properly-arranged electric circuits.

10 This invention is an improvement on the machine described in our specification marked "B," and forms part of the mechanism which we use in our improved system of telegraphing; and we do not in this application claim
15 broadly any of the mechanisms claimed in said specification B, but confine our claims in this application to the improved constructions of parts and to the combinations thereof, as hereinafter specifically claimed.

20 What we claim as our invention is—

1. The levers $D D' D^2$, levers $h h' h^2 h^3 h^4$, provided respectively with the rods $l l' l^2 l^3 l^4$, toothed wheels M' and b' , arm b^2 , provided with the pawl c , bar p^2 , provided with the detent p' ,
25 pin c^3 , and pawl b^3 , in combination with the posts $n n' n^2 n^3 n^4$ and $m m' m^2 m^3 m^4 m^5$, and connecting-wires y' , line-wires 1 2 3 4, and battery-wire 5, switch r , and wires q' and q^2 , all constructed and arranged substantially as described, to operate in the manner set forth.
30

2. The punching-rods $u u' u^2 u^3$, strip G , plate

w , and feed-rollers $f f'$, operated as described, in combination with the levers $D D' D^2$, levers $h h' h^2 h^3 h^4$, toothed wheels M' and b' , arm b^2 , provided with the pawl c' , bar p^2 , provided with
35 detent p' , pin c^3 , and pawl b^3 , all constructed and arranged to operate substantially as described, for the purpose of indenting the message.

3. The feeding device composed of the frame F , provided with the set-screws $i i' i^2 i^3 i^4$, and with the arms $c c$, ratchet-wheels e , feed-rollers $f f'$, and plates $w w^2$, as shown and described. 40

4. In combination with the mechanism herein shown and described for operating the levers $h h' h^2 h^3 h^4$, as set forth, the letter-wheel A , rotated by the ratchet-wheel C and pawl a , the pointer a^2 , secured to the shaft E , and the index s , operated by the rod s^2 on the hub of the wheel b' , all as shown and described, for the
45 purposes set forth. 50

5. In combination with the mechanism herein shown and described for operating the levers $h h' h^2 h^3 h^4$ in the manner set forth, the rods d' , eccentrics d^2 , and pawls d , as and for the
55 purpose set forth.

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