

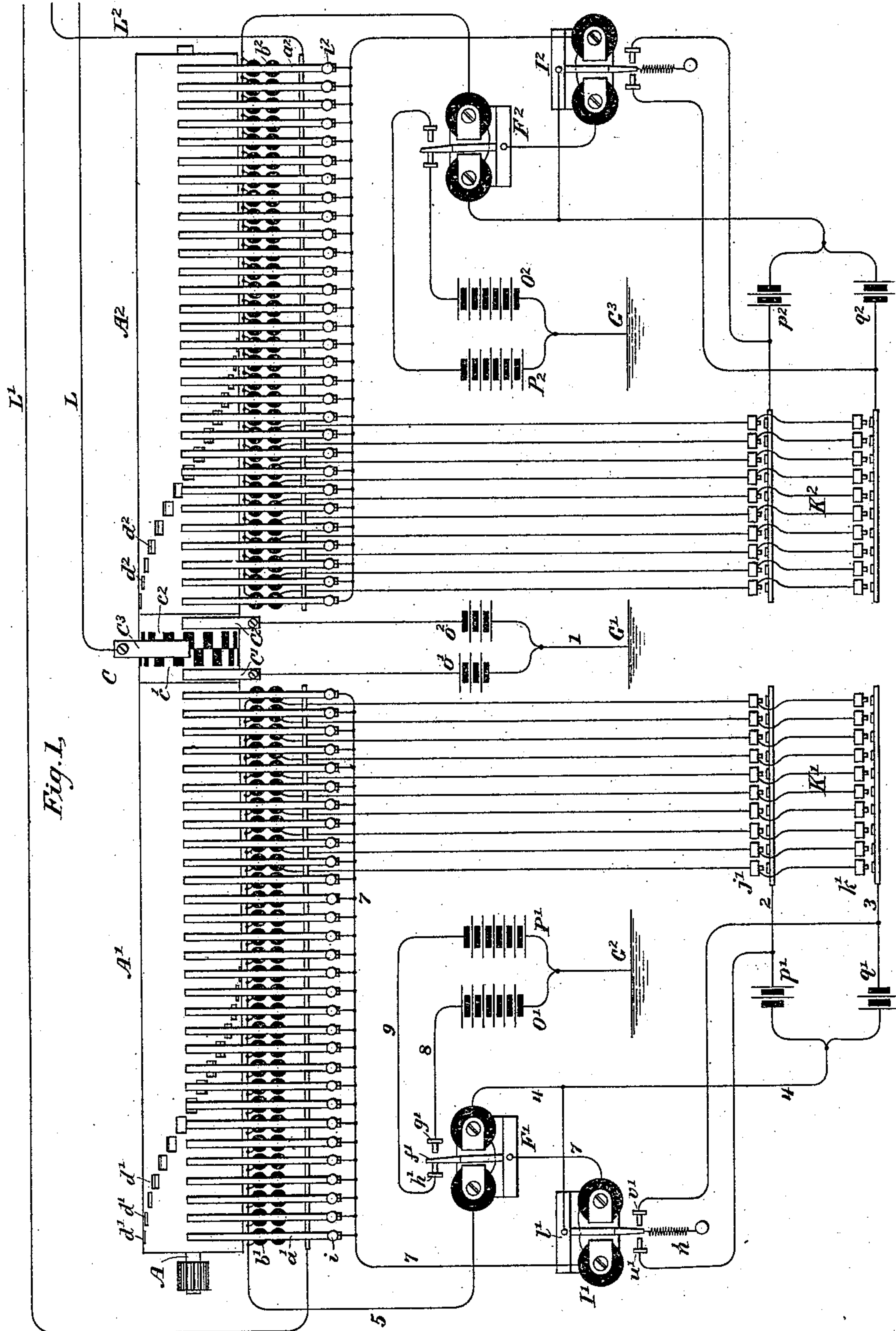
(No Model.)

2 Sheets—Sheet 1.

D. E. PIKE.
PRINTING TELEGRAPH.

No. 355,662.

Patented Jan. 4, 1887.



Witnesses

Geo. W. Dreck
Carrie C. Ashley

Inventor
Daniel E. Pike,

By his Attorneys

Robert Edgcomb

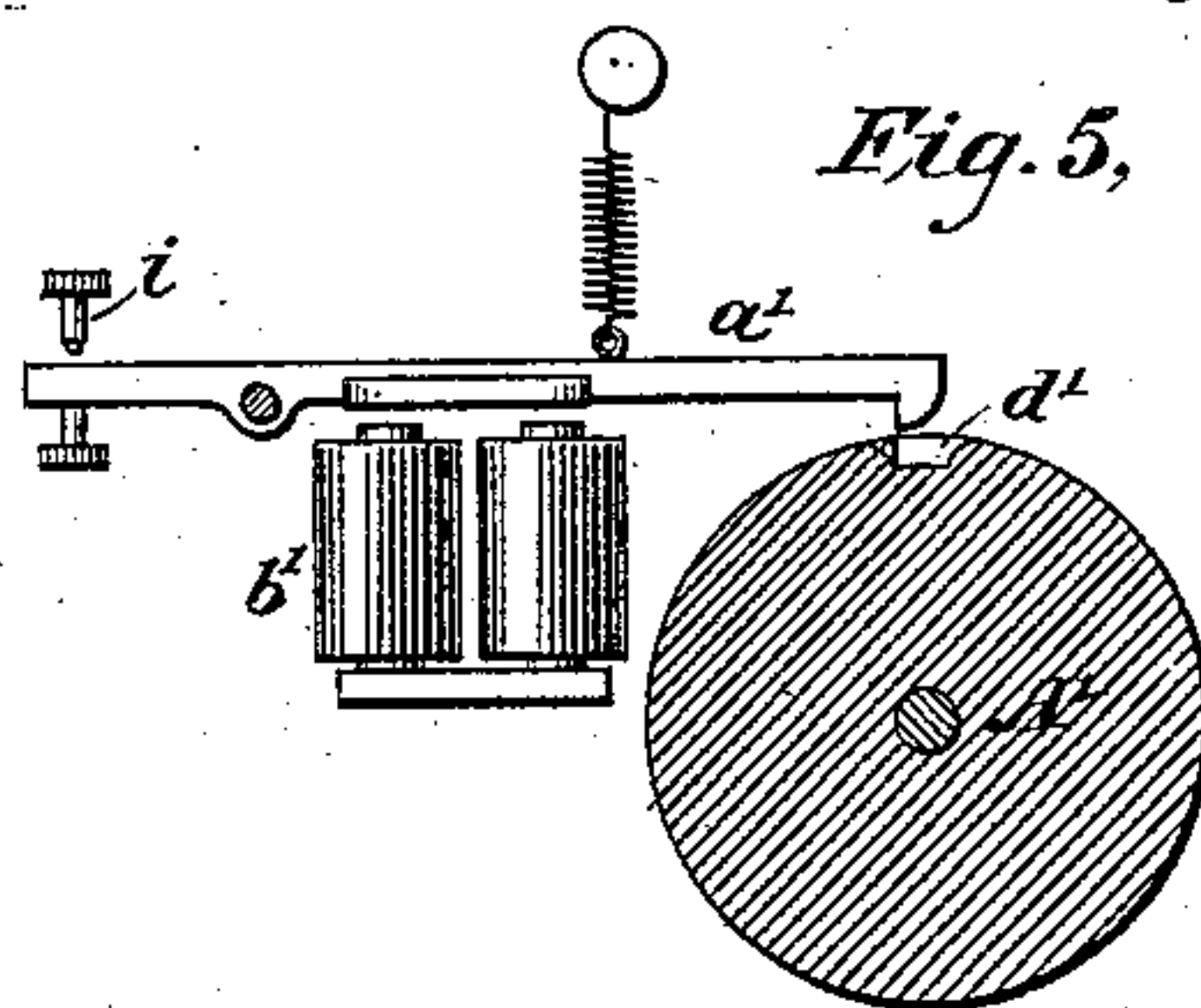
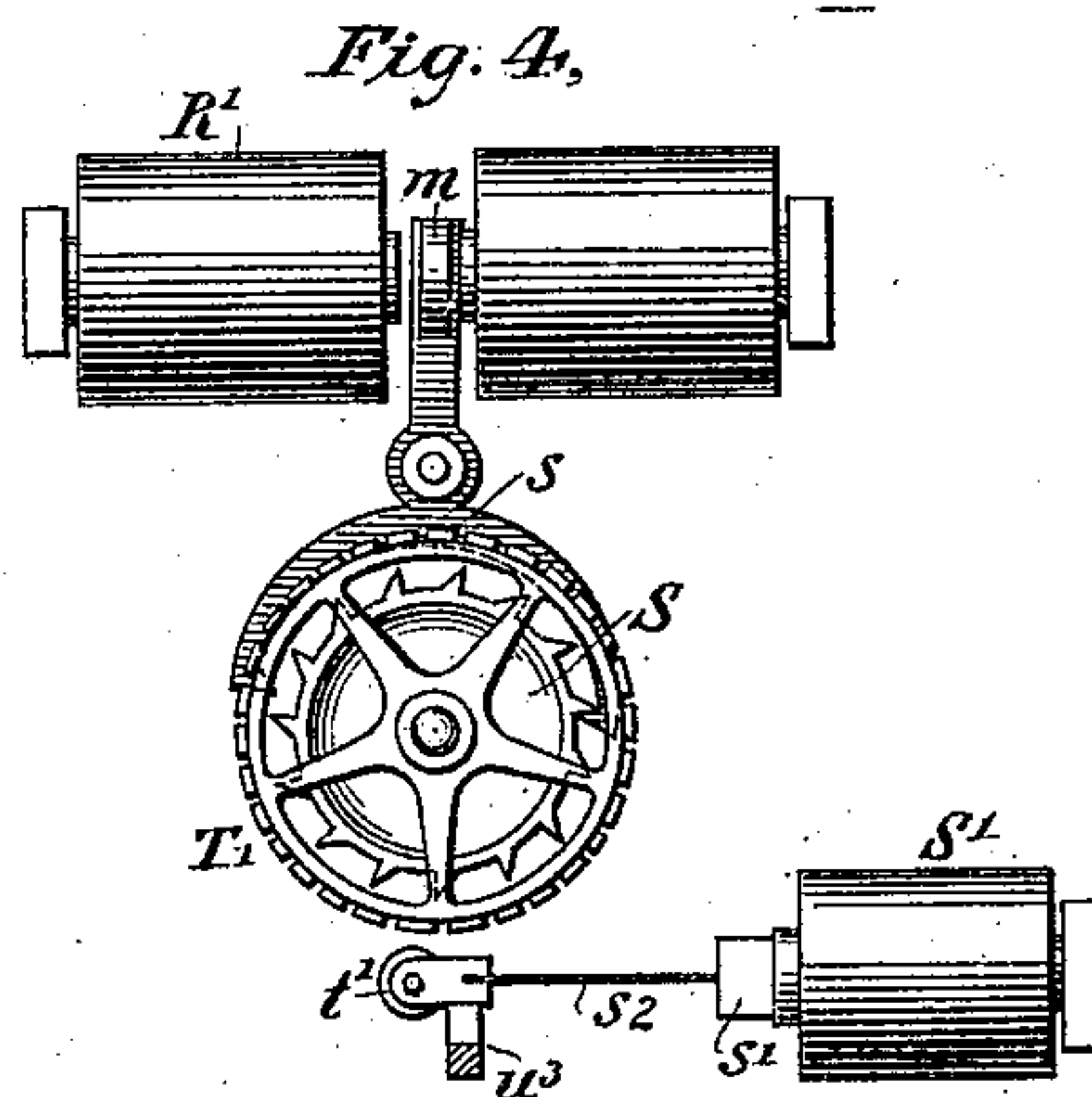
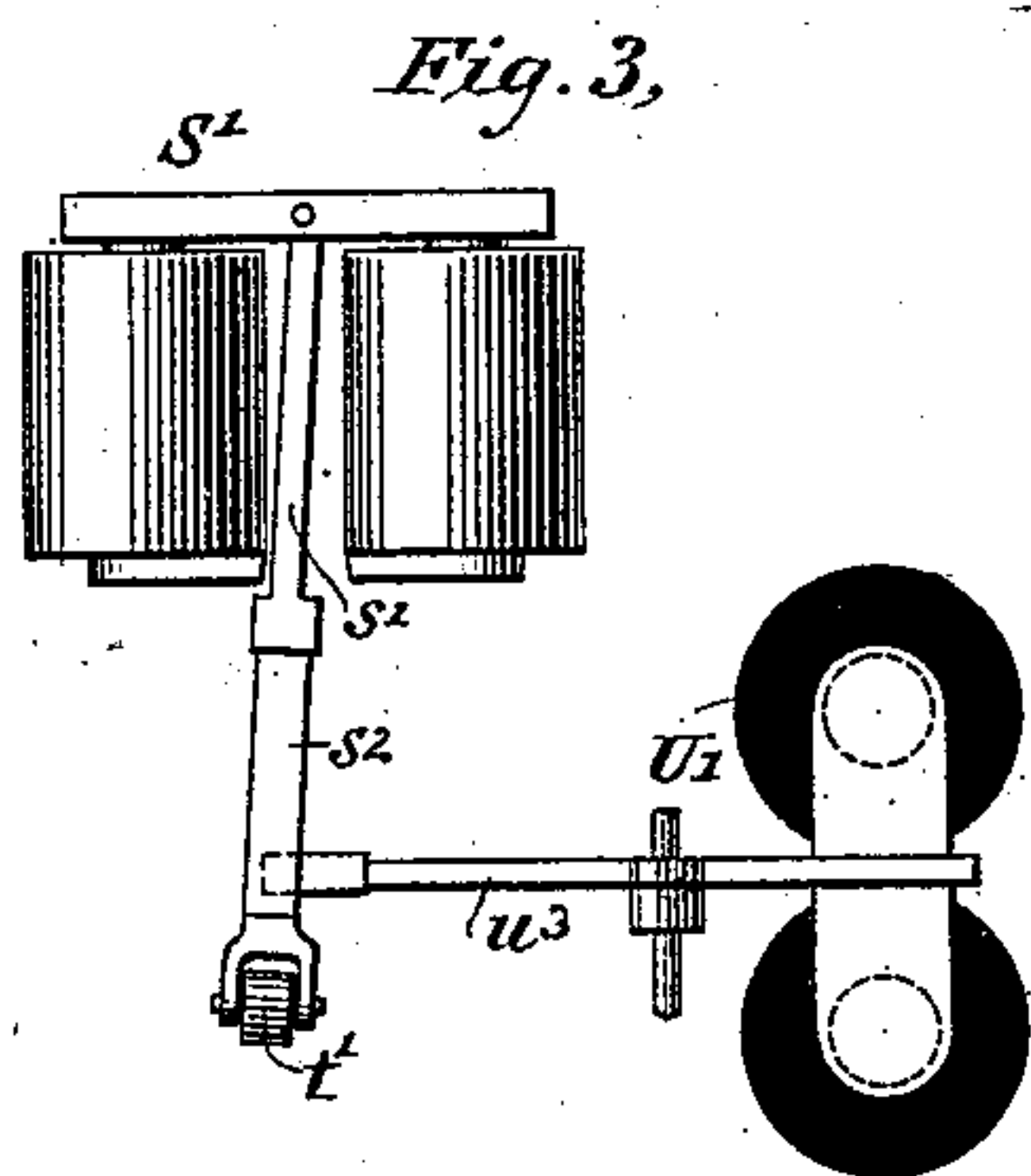
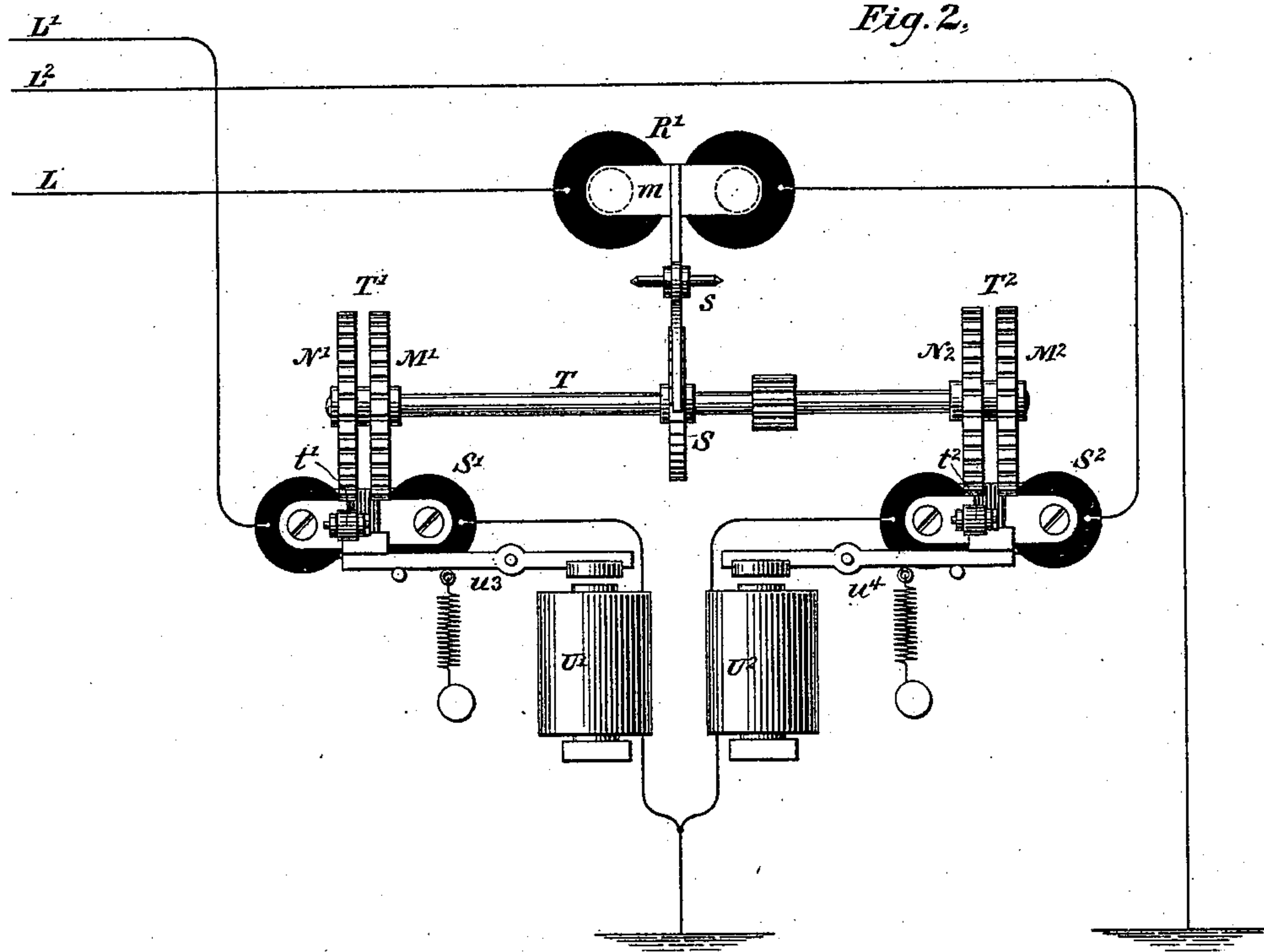
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2 Sheets—Sheet 2.

D. E. PIKE.
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Geo. W. Breck.
Carrie C. Ashley.

Inventor
Daniel E. Pike,

By his Attorneys

Robert Edgeworth

UNITED STATES PATENT OFFICE.

DANIEL E. PIKE, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO RALPH W. POPE, OF ELIZABETH, NEW JERSEY.

PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 355,662, dated January 4, 1887.

Application filed February 25, 1886. Serial No. 193,121. (No model.)

To all whom it may concern:

Be it known that I, DANIEL E. PIKE, a citizen of the United States, residing in New York, in the county and State of New York, have invented certain new and useful Improvements in Printing-Telegraphs, of which the following is a specification.

The invention relates to the class of apparatus employed for transmitting and receiving telegraphic dispatches and recording the same in printed characters or type.

It has become customary to revolve one or more type-wheels of a printing-telegraph instrument by means of alternating or intermittent electric currents, and to effect impressions from either type-wheel at will upon a receiving-tape or sheet of paper. The limit of speed with which such instruments may be operated is usually determined by the ability of the operator to handle the transmitting apparatus, rather than by the capability of the receiving-instrument to respond to the transmitter—that is to say—the type-wheels are capable of bringing the characters into position to print with greater rapidity than it has been found practicable for the transmitting-operator to select and print from them.

In telegraphic communication, of whatever character, it usually transpires that during some portion of the day a greater amount of business is required than during other portions, so that an instrument capable of meeting the requirements at certain times is not capable of doing so at other periods. A special instance of this is found in recording stock-quotations. Usually a greater amount of business is transacted at the exchanges during the first hours of the day than during the latter portions, so that although a single stock-printer is sufficient to record the transactions which may occur during certain portions of the day, yet at other times it is inadequate to the demands occasioned by the greater number of transactions occurring at once. Moreover, it is usual that in the busier portions of the day a great many sales occur simultaneously, and it is desirable that these should be reported as quickly as possible. Other instances where the amount of work to be done

by printing-telegraphs is variable are found in news-reporting and press-dispatches.

The object of this invention is, therefore, to provide means whereby, by the addition of a few instrumentalities, the increased demands may be accommodated as they occur, and also to provide means for separating the different classes of reporting which are to be made from the same office. Thus, for instance, it is often desirable to print the stock-quotations upon one slip or tape, and the transfers of bonds and special securities upon one or more independent tapes, and to accomplish this without materially, if at all, retarding the operation of the instrument when employed for printing upon a single slip.

In general terms, the invention consists in adding to a printing-telegraph instrument, which in its general structure resembles any of the well-known forms, additional type-wheels carried upon or connected with the same shaft and revolved by the same instrumentalities heretofore employed. These additional type-wheels are provided with similar apparatus for printing from either type-wheel at will, so that during the time that is necessarily lost in selecting the different transmitting-keys and effecting impressions from one set of type-wheels one or more additional transmitters may be operated and impressions effected from the additional type-wheels. Each printing device is included in an independent line and provided with its own transmitter, so that currents are sent to the different press-magnets either at the same or different times, accordingly as impressions are to be effected by both simultaneously or at different times.

In carrying out the invention certain modifications and adaptations of both the transmitting and receiving apparatus are essential, and a description of an organization of apparatus adapted to the purposes of the invention will be given in connection with the accompanying drawings.

In these drawings, Figure 1 is a diagram illustrating the organization of the transmitting apparatus, showing the circuit-connections. Fig. 2 is a diagram of the receiving

apparatus. Figs. 3 and 4 illustrate details of the receiving apparatus, and Fig. 5 is a detail view of the transmitting-instrument.

Two sets of transmitting-keys, K' and K'' , are employed, and the currents caused by them to traverse the respective lines L' and L'' are employed for operating independent printing devices applied to two sets of type wheels, T' and T'' , carried upon a single type-wheel shaft. It may here be remarked that the invention is not, however, confined to two sets of transmitting devices and the type-wheels, but may be extended, as will be evident from the following description. The movements of the shaft T are controlled by currents transmitted over a line, L .

The means whereby the various classes of currents are transmitted will first be described. A transmitting-shaft, A , is revolved by any suitable power, and is capable of being arrested in any required position by a series of levers, a' a' and a'' a'' . These levers are employed for transmitting printing-currents, and the printing currents are either positive or negative, according as it is desired to print from one or the other of the corresponding type-wheels, and they also determine the particular character to be printed by determining the position in which the shaft A shall be arrested. There is carried by the shaft a circuit-controller or pole-changer, C , adapted to transmit alternating currents to the main line L from two batteries, o' and o'' , for the purpose of operating the escapement of the receiving-instrument. The pole-changer preferably consists of two series of alternating conducting-surfaces, c' and c'' . Two brushes, C' and C'' , respectively, connect these surfaces with the positive pole of the battery o' and the negative pole of the battery o'' . The remaining poles are connected with the earth at G' by a conductor, 1. A brush, C^3 , extends over both series of segments and makes alternate contact therewith. This brush is connected with the main line L , and in this manner a determinate number of alternating impulses is sent to the line L at each revolution of the shaft A . These secure a revolution of the type-wheel shaft T for each revolution of the transmitter-shaft A , the number of conducting and intervening non-conducting surfaces being dependent upon the number of characters or type upon each type-wheel, and determined in the usual manner.

Opposite each conducting-segment there is formed an indentation or notch, as shown at d' d' , upon one side of the commutator, and a second series is arranged in like manner upon the other side. Each of these series is arranged in a spiral line, so that one revolution of the shaft will complete one turn of the notches. These notches serve, in connection with the levers a' and a'' , to arrest the transmitting-shaft in a position dependent upon the particular lever operated, and thus each notch will represent a particular character upon the type-wheel. When any lever is actuated, the

shaft will continue to revolve until the notch in line with that lever comes beneath its end, whereupon the lever will drop into the notch and hold the shaft until the lever is withdrawn. This movement of any lever not only arrests the shaft, but serves to transmit a current to the corresponding line, L' or L'' , from the corresponding battery, O' or O'' , as will hereinafter appear.

The levers a' a' are each provided with an actuating electro-magnet, as shown at b' b' , and these are vitalized by currents from a battery, p' or q' , accordingly as a key in a division, j' or k' , in the series K' is operated. For this purpose the keys j' , which, respectively, correspond to the characters upon the letter type-wheel N' of the set T' , are provided with contact-points connected by a conductor, 2, with the positive pole of the battery p' , and the keys in the division k' are provided with contact-points connected with the negative pole of the battery q' by a conductor, 3. The remaining poles of these batteries are connected by a conductor, 4, through the coils of an electro-magnet, F' , with a conductor, 5. The levers of the keys in the division j' are respectively connected through the coils of the respective electro-magnets b' , applied to the levers a' . The conductors leading from these magnets are united with the conductor 5. The levers of the keys in the division k' are respectively connected with the conductors leading from the levers of the division j' , and thus each magnet may be vitalized either by a key in the division j' or the corresponding key in the division k' . The currents transmitted through the conductor 4, and thus the electro-magnet F' , will, however, be one of polarity for one division of keys, and of the opposite for the other division. This difference of polarity is employed for moving the polarized armature f' of the magnet F' against a stop, g' or h' , and thereby determining whether a positive current shall be sent upon the line L' from a battery, O' , or a negative current from the battery P' . The polarity of the current sent determines whether printing shall be effected from the letter or figure wheel of the set T' . The connected keys, therefore, of the divisions j' and k' , respectively, correspond to the characters located in the same radial lines upon the two type-wheels.

Each lever a' is provided with a contact-stop, i' . The levers themselves are all connected with the main line L' . The contact-stops are connected by a conductor, 7, with the polarized armature f' , and the contact-points g' and h' are respectively connected by conductors 8 and 9 with the positive pole of the battery O' and the negative pole of the battery P' . The remaining poles are connected with the earth at G'' . It will be seen, therefore, that accordingly as the lever f' is thrown against one stop or the other the battery O' or P' will be connected with the contact-stops i' . Any lever a' , however, which may have been acted upon by its magnet b' will not come into contact with

its stop i' until the corresponding depression in the cylinder A' comes beneath its hooked end, which then falls into the notch and arrests the cylinder. Thereupon the lever is allowed to approach its magnet, and the cylinder is arrested and contact made with the corresponding stop i' . It is desirable that the transmitter shall be released and the shaft allowed to again advance the moment an impulse has been sent from either battery O' or P' . This may be readily accomplished by causing the impulse to vitalize an electro-magnet, I' , included in the conductor 7, and provided with a polarized armature, l' . The armature-lever l' is connected with the conductor 4, and its respective contact-points u' and v' are connected with the conductors 2 and 3. This armature will make contact with one or the other of these stops, accordingly as a positive or a negative current is sent to line, and the connections are such that it will then short-circuit the battery p' or q' , by means of which the cylinder is arrested and the current sent. The lever a' will thereupon be released and the cylinder A' again advanced. The magnet I' may be made to respond more or less slowly, as required. A spring, n' , holds the lever away from both stops when no current is upon the line L' .

The other transmitting device, A^2 , applied to the shaft A , is precisely similar to that described, and the corresponding parts are indicated by corresponding letters of reference, having the numeral 2 affixed thereto in place of the numeral 1.

It is designed that the currents transmitted by the pole-changer C shall operate the escapement-anchors of the receiving-instrument, and that the currents transmitted upon the line L' from the batteries O' and P' shall operate printing and platen shifting devices applied to the type-wheels N' and M' . The currents sent upon the line L^2 from the batteries O^2 and P^2 effect impressions from one or the other of the type-wheels N^2 and M^2 . All of these type-wheels are mounted upon the shaft T , upon which there is a scape-wheel, S , to which the anchor s is applied. The anchor is carried by an armature, m , extending between the confronting poles of two escapement-magnets, R' , included in the main line L . The alternating currents upon this line serve to vibrate this escapement in a manner well understood. The type-wheels are thus all advanced step-by-step together, and by arresting the movement of the transmitting-shaft A by any one of the levers a' or a^2 the type-wheel shaft will be also arrested. The characters which then confront the printing-pads t' and t^2 , respectively applied thereto, will correspond to the keys employed for arresting the transmitting-shaft in such position. The current which is transmitted over the line L' or L^2 at the moment the shaft is thus arrested will be either positive or negative, according to the key which is actuated, and the character of the current will determine from which type-wheel, N' or M' , impressions shall

be effected. This result is conveniently accomplished by employing a polarized armature, s' , carrying at its end a flexible extension, s^2 , upon which is mounted the printing-platen t' . An electro-magnet, S' , included in the main line L' , acts upon this armature and impels it in one direction or the opposite, according to the polarity of the current transmitted. Thus the platen is moved from its position beneath one type-wheel to the other type-wheel by a reversal of the current. A press-magnet, U' , is also included in the line L' , and this magnet responds to the currents from either battery O' or P' , but not so quickly as the electro-magnet S' , so that the platen will have time to be shifted before the lever u' responds and presses the platen t' against the type-wheel from which an impression is to be effected.

The means employed to effect impressions from either of the other two type-wheels, M^2 and N^2 , are precisely similar, being operated by currents from the batteries O^2 and P^2 , and acting upon electro-magnets S^2 and U^2 . It is evident that at the same time an impression is being made from either type-wheel N' or M' an impression may be taken of either of the characters upon the other type-wheels, M^2 or N^2 , which then confront the printing-platen t^2 , and that while the transmitter is operating to transmit a message composed by one transmitting-operator it also transmits that composed by the other operator, so that there is no delay due to unnecessary movement of the type-wheels, and impressions will be taken from one or the other set of wheels, or from both at the same time.

It is not desired in any way to restrict the application of the invention to the precise organization shown and described, as it is evident that other means may be adopted for transmitting the proper electric currents for determining from which type-wheel the impressions are to be effected, and also that the special apparatus described for arresting and releasing the transmitting-cylinder may be replaced by other devices. For example, instead of arresting the transmitting-cylinder by the arm a , when a printing-impulse is to be sent, both sides of the depressions d' may be cut away or curved, as indicated in dotted lines in Fig. 5. The levers a' will then merely fall into the depressions and be again lifted out after the impulse has been sent. In this manner impressions are effected without stopping the cylinder and the type-wheels. Again, it is not necessary that a mechanical escapement for the type-wheel shaft be employed, but the position of the type-wheels may be determined by an electric motor. In practice, however, the operators usually become so skilled that they release the keys the moment they transmit their impulses, and so there is no delay occasioned by one of them stopping the instrument an unnecessarily long time.

I claim as my invention—

1. In a printing-telegraph, the combination, with the type-wheel shaft and means for trans-

mitting currents for revolving the same, of two press mechanisms and their actuating-magnets, two main lines, respectively including the magnets and two independently-operating transmitters for transmitting currents for operating said mechanisms one at a time, or together, at will.

2. The combination, substantially as hereinbefore set forth, of a type-wheel shaft, two similar type-wheels moving therewith, a single escapement applied to said type-wheel shaft, two press-magnets, respectively applied to the type-wheels, two main lines, respectively including said magnets, and two independent transmitters applied to the two lines.

3. The combination, substantially as hereinbefore set forth, of two type-wheels, a single instrumentality for revolving both the same, independent printing devices, respectively applied to said type-wheels, and two independently-operating transmitters for operating the same, one at a time, or simultaneously, as desired.

4. The combination, substantially as hereinbefore set forth, with a type-wheel and means for revolving the same, of two similar type-wheels or pairs of type-wheels, two independent impression devices applied thereto, and two transmitters, respectively connected with said impression devices for operating the same, either separately, or together, at will.

5. The combination, substantially as hereinbefore set forth, of a type-wheel shaft, two pairs of type-wheels revolving therewith, impression devices for printing from said pairs of type-wheels, one at a time, or simultaneously, means for transmitting currents for revolving said type-wheels, and independent transmitting devices for operating said impression devices, respectively.

6. The combination, substantially as hereinbefore set forth, of a main line, means for transmitting alternating or intermittent currents over the same, a type-wheel shaft controlled by said currents, two or more type-wheels or pairs of type-wheels revolved by said shaft, an impression device for each of said type-wheels or pairs of type-wheels, an electro-magnet for operating each impression device, an independent main line for each of said electro-magnets, and transmitting devices for controlling each impression device through its electro-magnet, substantially as described.

7. The combination, substantially as hereinbefore set forth, of a transmitter consisting of a revolving cylinder, means for transmitting alternating currents by the revolution of

said cylinder, two or more series of transmitting-keys, two or more corresponding series of transmitting-levers under the control of said keys, means for actuating each of said levers by a corresponding key, and transmitting a current when the cylinder is in a predetermined position dependent upon the key, and a receiving device consisting of a single escapement, two or more type-wheels or sets of type-wheels controlled by said escapement, and two or more impression devices responding to currents occasioned by said series of keys, respectively.

8. The combination, substantially as hereinbefore set forth, of three main lines, two series of transmitting-keys, respectively applied to two of said lines, two series of circuit-closing levers controlled by said series of keys, respectively, means for transmitting alternate or intermittent currents upon the third line, means for transmitting currents upon either or both of the first-named lines through the agency of any of their keys and levers, and means for releasing such levers the moment they have transmitted a corresponding current.

9. In a printing telegraph transmitter, the combination, substantially as hereinbefore set forth, with an electro-magnet, its armature-lever, and means for vitalizing said electro-magnet, of a main line, and means for transmitting a current thereto by the lever of said magnet, an electro-magnet included in the circuit of the main line, its armature and contact-points, and means for demagnetizing the first-named electro-magnet when the second-named electro magnet is vitalized, substantially as described.

10. The combination, substantially as hereinbefore set forth, of a main line, means for transmitting a continuous series of electric impulses thereto, a series of transmitting-keys, a series of circuit-closing levers controlled thereby, a cylinder having a depression for each lever and permitting each lever to be momentarily actuated at a predetermined point in the succession of impulses, a second main line, and means for transmitting an impulse by any lever so actuated upon the second line without interrupting the succession of impulses.

In testimony whereof I have hereunto subscribed my name this 15th day of February, A. D. 1886.

DANIEL E. PIKE.

Witnesses:

CAROLINE E. DAVIDSON,
CHARLES A. TERRY.