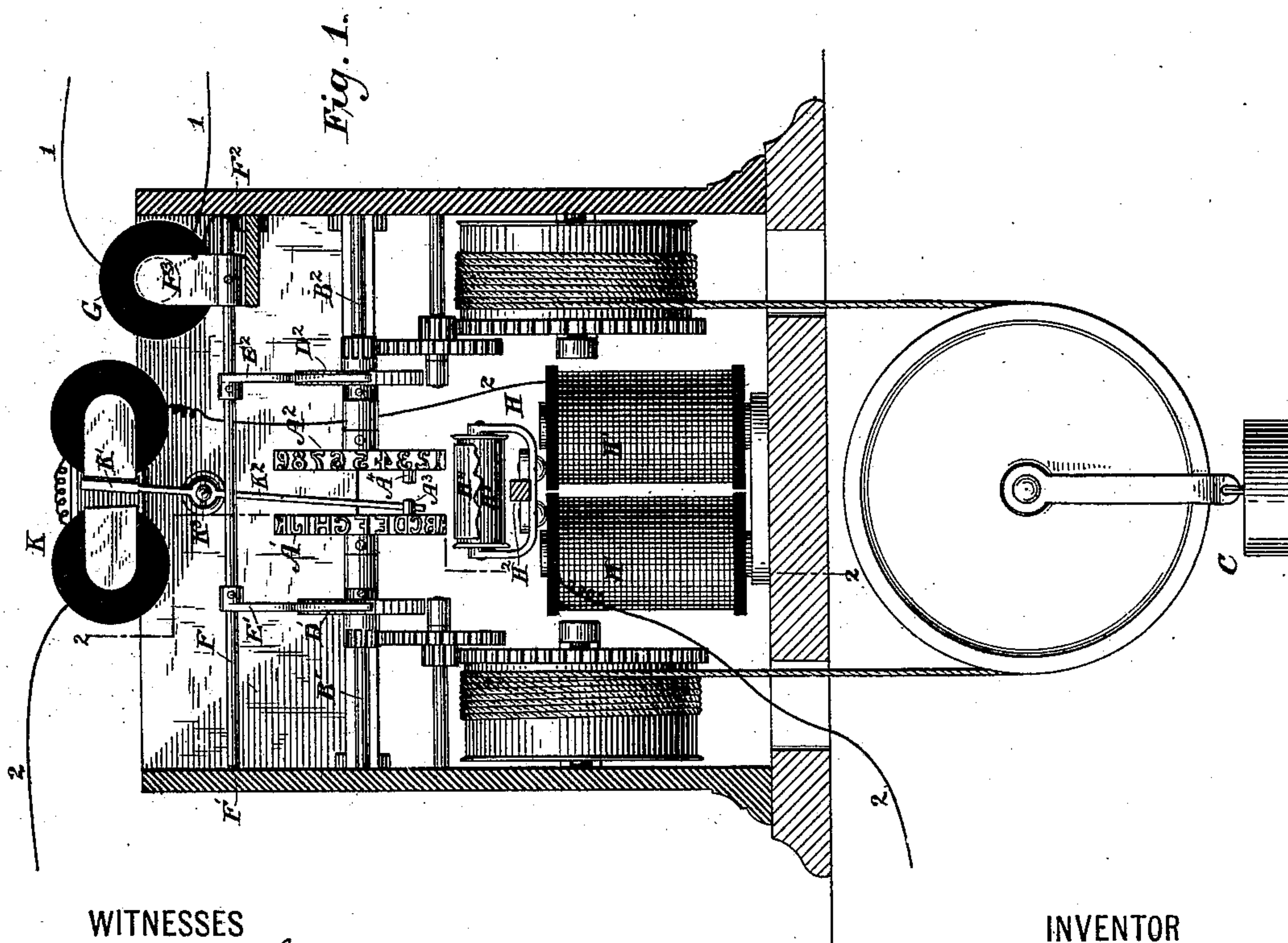
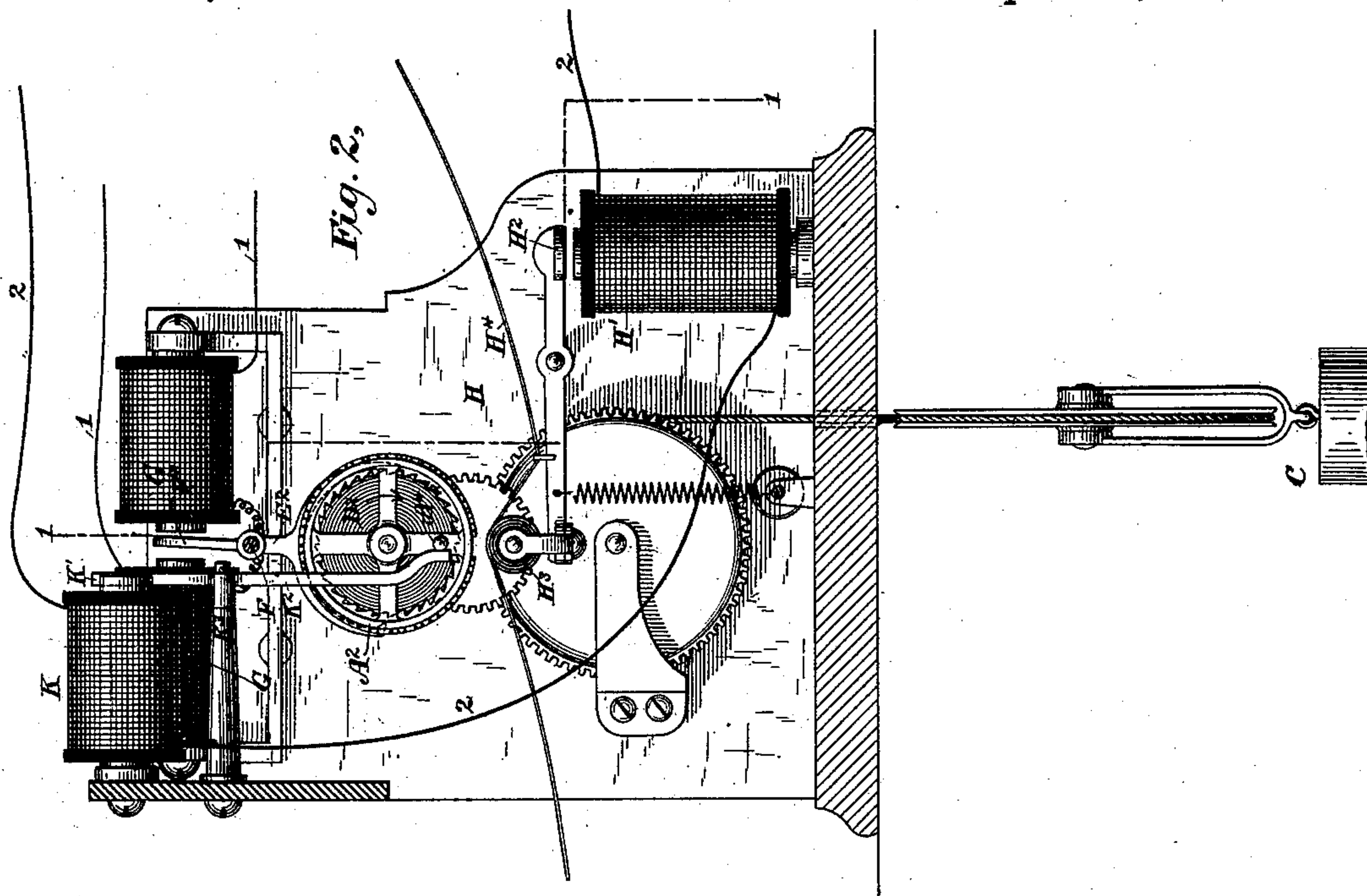


(No Model.)

S. D. FIELD.
PRINTING TELEGRAPH.

No. 370,691.

Patented Sept. 27, 1887.



WITNESSES

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UNITED STATES PATENT OFFICE.

STEPHEN D. FIELD, OF NEW YORK, N. Y., ASSIGNOR TO THE COMMERCIAL TELEGRAM COMPANY, OF SAME PLACE.

PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 370,691, dated September 27, 1887.

Application filed December 13, 1882. Serial No. 79,185. (No model.)

To all whom it may concern:

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

My invention relates to that class of electric appliances the object of which is to record in printed characters at a receiving-station the communications transmitted from a sending-station. It particularly relates to a certain class of printing-telegraphs in which the type-wheels of the receiving-instrument are impelled by means of a constant force—as, for example, a weight or spring acting through suitable intermediate wheel-work—and in which said constant force is subordinated to and controlled by certain electrical conditions established upon one or more line-wires.

My invention has for its object to furnish a simple, rapid, and certain receiving-instrument for a printing-telegraph system especially adaptable to the transmission of quotations of stocks, &c.

The essential features of my improved receiving-instrument are as follows: The instrument is provided with two type-wheels carried by independent shafts. One wheel may conveniently carry the letters and the other the numerals, and each is provided with a blank or unison point, which may represent either a space or a dot. Through the agency of suitable driving mechanisms a tendency is given to both wheels to revolve continuously in the same direction. The intermittent advance movements of the type-wheels are controlled, first, by an escapement mechanism common to both, which acts simultaneously upon each under the influence of intermittent pulsations of current traversing a conductor preferably devoted to this purpose alone; and, secondly, said advance movements are independently governed by the action of an arresting mechanism, the object of which is to hold one of the wheels at its blank or unison point during the periods in which the other wheel is in operation. This arresting mechanism is operated by the same current which actuates the impression-producing mechanism or press; but while the press is actuated to produce an im-

pression by currents of either polarity, the character of the action of the arresting mechanism depends upon the direction or polarity of the current. Thus a copper current may be used to arrest the letter-wheel and a zinc current to arrest the figure-wheel, while either current will serve to actuate the impression-producing mechanism. When either wheel has once been arrested, it retains its position of arrest—that is, with its blank space presented to the receiving-strip of paper—so long as there is no change in the polarity of the printing-currents. The other type-wheel, being free to advance under the action of the intermittent current, may be proceeded with independently, and any number of successive impressions may be taken therefrom, so long as the polarity of the printing-current is not changed. When it is desired to print from the other wheel, the operator at the transmitting-station will first bring the wheel which has been in use to the unison or blank point, and will there arrest it by reversing the current. The same action not only liberates the other wheel, but liberates it in unison with the transmitting device, so that it may proceed independently in the manner described.

My invention is set forth in the accompanying drawings, which are especially designed to exhibit the principle of operation of the apparatus.

Figure 1 is a front view, and Fig. 2 a side view, the case of the instrument being shown partly in section.

Referring to the drawings, the type-wheels are shown at A' and A². The former may conveniently carry the letters, and the latter the numerals, punctuation-points, and other miscellaneous characters, as desired, this being a matter of discretion. Both are provided with blank or unison spaces. Each type-wheel is carried upon a separate shaft, as seen at B' and B², and both shafts are driven by the weight C, acting through suitable intermediate mechanism. Both type-wheels advance step by step in the same direction. The shafts, further, respectively carry escapement-wheels D' and D², each provided with a like number of teeth engaging with the pallets upon the anchors E' and E², carried by the rock-shaft F, which is arbores at points F' and F², and is provided

with an armature, F^3 , intervening between the confronting poles of the polarized magnet G . The latter is included in the circuit of the line-conductor 1 1, which conveys impulses alternately positive and negative established thereupon by any suitable transmitting device. The independent circuit of conductors 2 2 includes the operating-magnets of two distinct mechanisms—namely, the printing-press mechanism operated by the electro-magnet H' and the unison mechanism for detaining the type-wheels upon their blank spaces when out of use, operated by the polarized magnet K .

The printing mechanism is shown at H . It is actuated by an electro-magnet, H' , with a neutral armature, H^2 , included in the circuit 2 2 and responding to currents of either polarity. The armature H^2 carries a platen, H^3 , over which passes a band or tape of paper, H^4 .

The mechanism for feeding the paper may be of any suitable character, and may be actuated in any well-known manner—as, for example, by the retrograde movement of the printing lever or armature H^2 . With every impulse, therefore, of sufficient intensity, whether positive or negative, that traverses the circuit 2 2 an impression will be taken of the character or figure immediately above the platen at that particular instant. If, as is normally the case, the blank point of one of the wheels is above the platen, an impression will be taken from the other wheel only.

The device for arresting and detaining the particular type-wheel which is not in use is also operated by the current traversing the circuit 2 2, already referred to. It consists of an electro-magnet, K , between the poles of which a polarized armature, K' , carried by an armature-lever, K^2 , fulcrumed at K^3 , plays between the stops A^3 and A^4 , under the action of currents of alternating polarity, in a well-known manner. The type-wheels A' A^2 are respectively provided upon their confronting faces with projecting stops A^3 A^4 . The armature-lever K^2 is extended beyond its fulcrum K^3 , passing between the type-wheels A' and A^2 , as shown. When the magnet K is excited by positive currents, the polarized armature K' will be attracted toward one of the pole-pieces and the extension K^2 will be moved into the path of one of the stops—as, for example, the stop A^3 of the wheel A' . A current in the opposite direction will cause said extension to release the wheel A' and move into the path of the stop A^4 of the wheel A^2 . Inasmuch as this action is practically instantaneous, it will be understood that one or other of the type-wheels A' A^2 is at all times in a state of arrest by the action of the extension-piece K^2 . The other type-wheel is at the same time set free to revolve, and printing may be effected with it accordingly. The stops A^3 and A^4 are placed in such positions upon the faces of the wheels A' and A^2 as to determine the arrest of each wheel in a position with its blank or unison point presented to the press mechanism.

The functions of the transmitting apparatus designed to be employed in connection with the receiving apparatus herein described are, first, to establish upon the line 1 1 the requisite alternating pulsations for causing the step-by-step advance movement of the particular type-wheel which is in operation; second, to establish the printing-currents upon the line 2 2 when the type-wheel in use has reached the position in which the required character is presented for printing, said printing-current being of polarity such as not to actuate the arresting or unison mechanism; and, third, the transmitter should be provided with devices whereby the transmitting-operator may change the polarity of the current. To accomplish these results any of the well-known electrical appliances heretofore employed for such purposes may be made use of; but as such appliances do not constitute the subject-matter of this invention a detailed description of them is omitted.

The operation of passing from one wheel to the other is as follows: Assuming that the type-wheel A' has been in use, the type-wheel A^2 meantime remaining at rest, and that it is now desired to print from the wheel A^2 , the operator by properly manipulating his transmitting mechanism causes the wheel A' to advance to its blank or unison point. He then reverses the current which operates the unison mechanism, thus liberating the wheel A^2 and arresting the wheel A' . The wheel A^2 , having been previously stopped upon its blank or unison point, starts in unison with the transmitting mechanism, and thereafter moves in obedience thereto. Synchronism between the transmitter and receiver during the advancement of either wheel may be maintained in any well-known manner.

It is evident that the principle herein set forth of using two wheels and holding either in position while the other is in operation may be applied to a system in which only a single conductor is employed by using comparatively feeble currents to operate the magnet G , and more powerful currents of alternating polarities to actuate the magnets H and K .

I am aware that it is not new to control two independent type-wheels by separate escapements mounted upon independent levers, both of which levers are actuated, but not at the same time, by a single electro-magnet, the armature of such electro-magnet being mechanically connected with one or the other of the escapement-levers, as required, by means of a polarized tongue oscillating between the poles of said electro-magnet, and I therefore make no claim to such an organization.

I claim as my invention—

1. The combination of two independently-movable type-wheels, two stops connected one with each of said wheels, mechanism whereby a like advance movement is imparted to each of said wheels when they are free to revolve, and an obstructing or arresting mechanism actuated by the armature of an electro-magnet

to simultaneously move into the path of one and out of the path of the other of said stops, whereby one of said type-wheels is arrested at unison position and kept from revolving, and the other of said wheels is liberated at unison position and left free to revolve, and vice versa, substantially as hereinbefore set forth.

2. The combination, substantially as hereinbefore set forth, of two independent escape-wheels revolving in parallel planes, oscillating pallets for controlling the intermittent advance movements of each of said escape-wheels, an electro-magnet for simultaneously imparting a like oscillatory movement to the pallets of both of said escape-wheels, mechanism, substantially such as described, for arresting the advance movement of either one of said wheels and simultaneously liberating the other, and an independent electro-magnet for controlling the last-named mechanism.

3. The combination, substantially as hereinbefore set forth, of two independently-moving type-wheels, step-by-step escapement mechanism, whereby a like intermittent advance movement is imparted to each of said type-wheels, an electro-magnet in one line-wire for controlling said escapement mechanism, mechanism for locking one or the other of said type-wheels against the action of said escapement mechanism, and an electro-magnet in a second line-wire for determining the action of said locking mechanism upon one or the other of said type-wheels.

4. The combination, substantially as hereinbefore set forth, of two independently-moving type-wheels, step-by-step escapement mechanism whereby a like intermittent advance movement is imparted to each of said type-wheels, an electro-magnet in one line-wire for controlling said escapement mechanism, mechanism for locking one or the other of said type-wheels against the action of the escapement, an electro-magnet in a second line-wire for determining the action of said locking mechanism upon one or the other of said type-wheels, an impression-platen common to both type-wheels, and an electro-magnet included in the circuit of the second line-wire for actuating said platen.

5. The combination, substantially as hereinbefore set forth, of two independently-moving type-wheels, step-by-step escapement mechanism whereby a like intermittent advance movement is imparted to each of said type-wheels, an electro-magnet in one line-wire for actuating said escapement mechanism,

ism, mechanism for locking one or the other of said type-wheels against the action of said escapement, a polarized armature actuated by an electro-magnet in a second line-wire for determining the action of the locking mechanism upon one or the other of said type-wheels, an impression-platen common to both said type-wheels, and a neutral armature actuated by an electro-magnet included in the circuit of the second line-wire for actuating said platen.

6. The combination, substantially as hereinbefore set forth, of two independently-moving type-wheels, an escapement mechanism common to both said type-wheels for controlling their intermittent advance movement, and mechanism actuated by currents of a determinate polarity to hold one of said type-wheels in position to present its blank or zero point to the platen while permitting the other type-wheel to proceed, and by currents of an opposite polarity to release the type-wheel first arrested and lock the other type-wheel in the manner described.

7. The combination, substantially as hereinbefore set forth, of two independently-moving type-wheels, mechanism normally tending to advance said type-wheels in the same direction, escapement mechanism common to both type-wheels for controlling said advance movement in accordance with successive electric impulses from a transmitter, a platen or printing mechanism capable of taking impressions from either type-wheel, and a polarized armature actuated by currents of a determinate polarity to arrest one of said type-wheels at its zero-point and liberate the other to the action of the escapement, or by currents of reverse or opposite polarity to perform a reverse action.

8. The combination, substantially as hereinbefore set forth, of the lever-extension of a polarized armature, two independently-moving type-wheels, between the confronting faces of which said extension projects, mechanism whereby said wheels are advanced in the same direction, and stops upon said wheels for engaging with said projections respectively, according as said armature is actuated by currents of one or other polarity.

In testimony whereof I have hereunto subscribed my name this 6th day of December, A. D. 1882.

STEPHEN D. FIELD.

Witnesses:

MILLER C. EARL,
CHARLES A. TERRY.