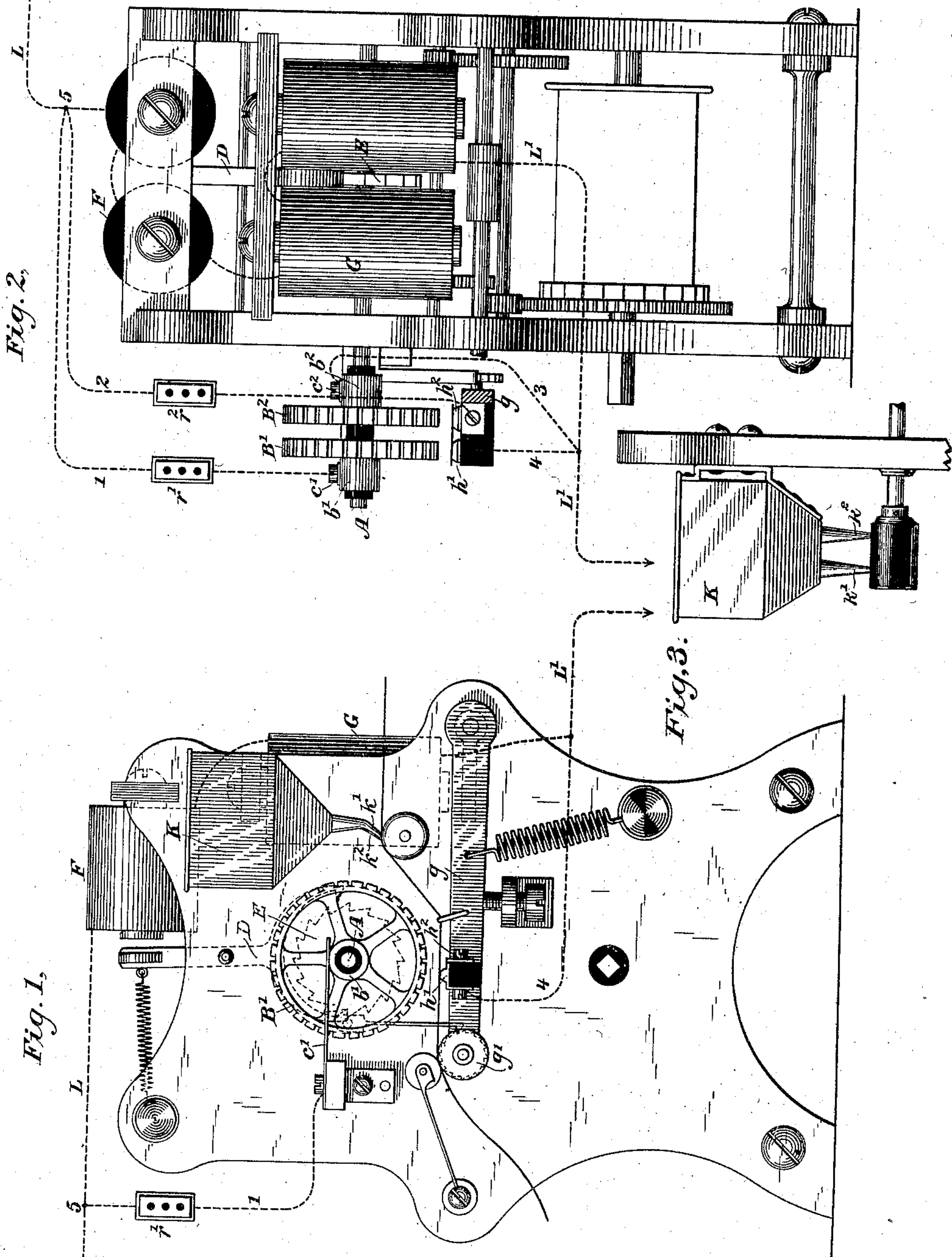


(No Model.)

H. VAN HOEVENBERGH.
CHEMICAL PRINTING TELEGRAPH.

No. 316,689.

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Witnesses

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CHEMICAL PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 316,689, dated April 28, 1885.

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To all whom it may concern:

Be it known that I, HENRY VAN HOEVENBERGH, a citizen of the United States, residing in Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Chemical Printing-Telegraphs, of which the following is a specification.

My invention relates both to the class of instruments employed for printing characters from type-wheels capable of being advanced by a step-by-step movement, and to the class of telegraphic apparatus employed for effecting upon chemically-prepared paper a record of a telegraphic dispatch through the action of electric currents.

Numerous methods have been devised for imparting to the type-wheels of telegraphic receiving-instruments a step-by-step motion, and for effecting impressions therefrom through the agency of a printing-platen, which is actuated when the desired type has been brought into position to print. There have also been devised various methods of recording telegraphic messages upon chemically-prepared paper through the agency of a recording-stylus moving along the surface of the paper. When electric currents are transmitted through the paper in the proper direction, marks or impressions will be formed thereupon by the discoloration of the paper. Currents in the opposite direction, however, do not produce corresponding discolorations upon the chemical paper. This action of electric currents upon chemical paper has also been utilized for the purpose of effecting impressions or imprints from metallic type representing different characters.

My invention consists in combining with any suitable means for revolving two type-wheels means for connecting the same in an electric circuit in such a manner that electric currents traversing the main line in one direction will effect impressions from one of the type-wheels, while electric currents traversing the main line in the opposite direction will effect impressions from the other type-wheel.

In carrying out my invention I prefer to mount both type-wheels rigidly upon a type-wheel shaft provided with suitable means for ef-

fecting a step-by-step movement of the wheels. The type are faced with platinum, iridium, or with other suitable metal which will not become greatly corroded by the action of electric currents. Suitable means are employed for feeding a chemically-prepared paper to the type-wheels and causing the same to be impelled toward the type-wheels when it is desired to effect impressions therefrom. The type-wheels are insulated from each other, and they are respectively provided with conducting-platens, which are also insulated from each other. One of the type-wheels and the platen of the remaining type-wheel are electrically connected with the main line leading to the instrument. The second type-wheel and the platen of the first-named type-wheel are in like manner connected with the conductor leading from the instrument. Two shunt-circuits will therefore be formed around the instrument when the platens are pressed against their respective type-wheels, the one circuit passing from the main line through the first type-wheel to its platen, and the second from the main line through the second platen to its type-wheel. If, therefore, the platens are impelled toward the type-wheels, thereby causing the chemically-prepared paper to rest against the same, an impression will be effected upon the paper from one or the other type-wheel, accordingly as the current upon the main line is in one direction or the other. Thus a positive current passing from the main line through the first type-wheel to its platen will effect an impression of the character upon that type-wheel against which the chemically-prepared paper rests. The same current, however, passing from the remaining platen to its type-wheel, will be in the wrong direction to effect an impression from the second type-wheel. When, however, the current transmitted over the line is reversed, it will be in the proper direction to effect an impression from the second type-wheel, but not from the first. The reason for this result will be evident when it is considered that a negative current passing from the platen of the second type-wheel to the type-wheel itself is in effect a positive current passing from that type-wheel to its platen. In

operating the instrument, therefore, it is necessary only to revolve the type-wheels until the character desired is above the printing-platen, and then, if that character is located upon the first-named type-wheel, to transmit a positive impulse of sufficient strength to operate the printing-platen, so that it will press the chemically-prepared paper against the type-wheels. If, however, the type desired is upon the second type-wheel, a current of negative polarity will effect a record of that character.

In the accompanying drawings, Figure 1 is a front elevation of such parts of an instrument as are necessary to illustrate the invention. Fig. 2 is a side elevation of the same, and Fig. 3 is a detail view showing both the outlets of the reservoir.

Referring to the drawings, A represents the type-wheel shaft, upon which are rigidly mounted two type-wheels, B' and B². The type-wheels B' and B² are insulated from each other as well as from the shaft upon which they are carried; but they are provided with two contact-surfaces, b' and b², respectively, against which rest contact-brushes c' and c², for effecting electrical connections therewith, in a manner hereinafter described. The type-wheels are revolved by means of a suitable escapement anchor, D, acting upon a scape-wheel, E, and controlled by an electro-magnet, F, in a manner well understood. The electro-magnet F is vitalized either by means of alternating electric impulses or by successive impulses of one polarity, as may be desired. Preferably, however, the latter construction is employed, so that to effect an advancement of the type-wheel it is necessary merely to transmit successive impulses of either positive or negative polarity over the main line. The main-line connections are continued from the electro-magnet F through the printing-magnet G, which is adapted to respond only to prolonged impulses of either character, or else to an increase in the strength of an impulse, whether positive or negative. Upon the armature-lever g of the electro-magnet G is carried a paper guide and support, g', and two printing platens or electrodes, h' and h², which are respectively applied to the type-wheels B' and B². The electrodes h' and h² are insulated from each other, as shown, and they are constructed of brass or of other suitable conducting material which is not liable to become corroded by the action of electricity and of the chemicals employed upon the paper tape.

The platens or printing-electrodes and the type-wheels are connected with the main-line circuit in the following manner: A conductor, 1, leading from a point, 5, in the main line, extends to the contact-brush c', which continues its connections to the type-wheel B'. A conductor, 2, extending from the same point in the main line, is connected with the platen or printing-electrode h², which is applied to type-wheel B². A conductor, 3, leads from

the brush c², applied to the type-wheel B², to the conductor L', leading from the instrument to the earth, and a conductor, 4, leads from the remaining printing-electrode h' to the same point in the conductor L'. It will be seen, therefore, that when the printing-electrodes rest against their type-wheels there will be formed two shunt-circuits around the electromagnets of the instrument. The impulses traversing one of these shunt-circuits will pass from the main line through the type-wheel B' to the platen h', while those traversing the other will pass from the platen h² to the type-wheel B². If, therefore, the current upon the main line be positive, it will chemically record upon the paper tape P, which is caused to intervene between the type-wheels and the platens, an impression of the type upon the wheel B' against which it rests. If, however, the current be negative, a record will be made in the same manner of a type upon the wheel B²; but in either case an impression will be taken from only one type-wheel, for the reason that the current will not act to effect impressions when in the opposite direction. In operating the instrument, therefore, it is necessary only to bring the type-wheels into position, so that the desired character is above the paper, and to then actuate the printing-lever by means of a current of positive or of negative polarity, accordingly as it is desired to print from the type-wheels B' or B².

It will be understood that only a fraction of the current traversing the main line will be required for effecting a record of the type upon the chemically-prepared paper, and for this reason adjustable artificial resistances r' and r² may, if desired, be inserted in the conductors 1 and 2, respectively, for the purpose of regulating the proportion of the current which shall traverse the shunt-circuit.

In practice it will be found convenient in printing continuously from one type-wheel to actuate the escapement device by currents having the polarity required to effect impressions from the type-wheel, and when it is desired to effect impressions from the other type-wheel it is necessary only to reverse the connections of the transmitting-battery.

For convenience and economy in applying the chemical solutions to the paper, I prefer to employ a reservoir, K, having two outlets or feeding-points, k' and k², through which the fluid is allowed to escape upon the paper tape as it is being supplied to the printing-instrument. The two points thus lie in the proper position to apply lines of chemicals to the paper as the latter is fed to the type of the respective type-wheels by means of any suitable paper-feeding device.

In practice any suitable well-known chemical solutions adapted to be suitably acted upon by currents in one direction, but not by currents in the opposite direction, may be employed.

I claim as my invention—

1. The combination, substantially as herein-

before set forth, with two type-wheels and means for revolving the same, of two insulated printing platens or electrodes, conductors connecting one of said type-wheels and one of said electrodes with the main line leading to the instrument, conductors connecting the remaining type-wheel and the remaining platen with the main-line conductor leading from the instrument, and means for impelling said electrodes toward said type-wheels.

2. The combination, substantially as hereinbefore set forth, with two insulated type-wheels and means for revolving the same, of a telegraphic main line, two insulated printing platens or electrodes, and means for transmitting an electric impulse from one of said type-wheels to its printing-platen and at the same time an impulse from the remaining of said platens to the corresponding type-wheel.

3. The combination, substantially as hereinbefore set forth, with two insulated type-wheels and means for revolving the same, of two insulated printing-electrodes, means for passing a chemically-prepared paper beneath said type-wheels and for causing said electrodes to press said chemically-prepared paper against said type-wheels, and means, substantially as described, for causing a positive current to pass from either type-wheel to its electrode at will, thereby causing an imprint to be made upon said chemically-prepared paper.

4. The combination, substantially as hereinbefore set forth, with a main line, two insulated type-wheels, and means for revolving the same, of two insulated printing-electrodes applied thereto, means for supporting a strip of chemically-prepared paper beneath said type-wheels, and means, substantially such as described, for causing an electric current to pass from one type-wheel to its electrode or from the other type-wheel to its electrode, thereby causing an impression to be effected from one or the other of said type-wheels upon said paper accordingly as an electric current is transmitted over said main line in one direction or the other.

5. The combination, substantially as hereinbefore set forth, with two or more type-wheels and means, substantially such as described, for effecting impressions therefrom upon chemically-prepared paper, of a chemical-solution reservoir having two outlets, and means, substantially such as described, for causing the paper to pass beneath said outlets to said type-wheels.

In testimony whereof I have hereunto subscribed my name this 14th day of April, A. D. 1884.

HENRY VAN HOEVENBERGH, [L. s.]

Witnesses:

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