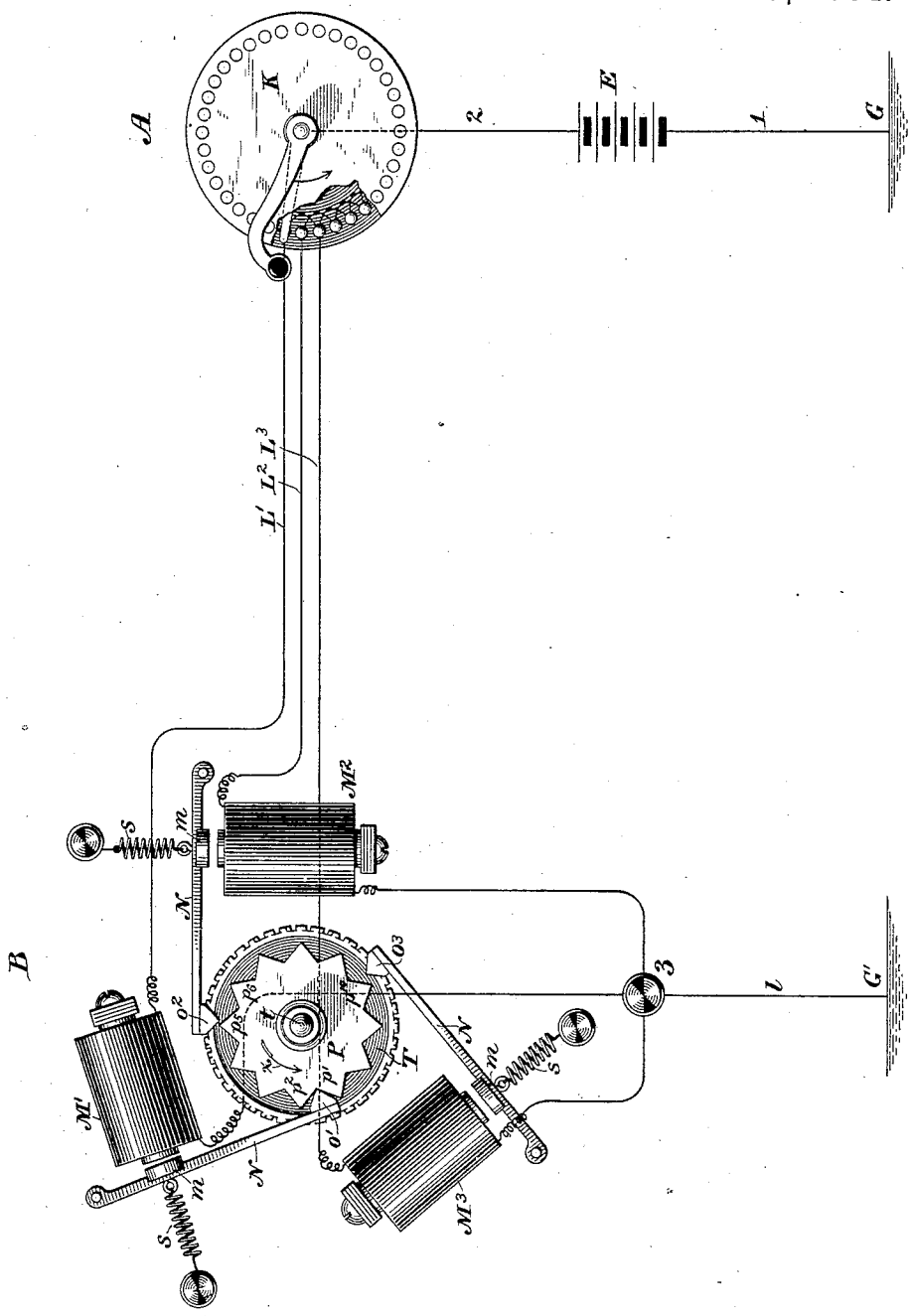
(No Model.)

H. VAN HOEVENBERGH.

ELECTRO MECHANICAL MOVEMENT.

No. 293,923. Patented Feb. 19, 1884.



WITNESSES

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HENRY VAN HOEVENBERGH, OF ELIZABETH, NEW JERSEY.

ELECTRO-MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 293,923, dated February 19, 1884.

Application filed April 30, 1883. (No model.)

To all whom it may concern:

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

My invention relates to certain improvements in the construction of apparatus, and in the organization of electric circuits for actuating electro-magnetic motors.

The invention is chiefly applicable to the class of electric motors employed in printing-telegraph systems for rotating the type-wheels of the receiving-instruments.

The object of the invention is to provide means for actuating the motor in either of two directions, and arresting its movement as required for placing any particular type in a predetermined position.

The invention consists in combining with a series of line-conductors and apparatus for transmitting electric currents or impulses upon them in succession a series of electro-magnets, respectively, included in the circuit of those conductors. These electro-magnets are provided with armature-levers carrying pawls, which engage the teeth of a star-wheel, causing it to rotate in one direction or the other, according to the order of succession in which the electro-magnets are vitalized. The teeth of the wheel are preferably beveled at the same angle upon each side. The pawls or pallets at the extremities of the armature-levers conform in outline to the spaces intervening between two adjacent teeth. These pallets, by being successively pressed against the periphery of the wheel, act to move the wheel, in one direction or the other, in such a manner to bring the re-entering angle or the point midway between two adjacent teeth into the same radial line with the face or salient angle of the pallet, which thus engages the wheel.

The accompanying drawing is a diagram illustrating my invention as applied to a printing-telegraph system.

Referring to this drawing, A and B, respectively, designate the transmitting and a receiving station of a telegraph system, and L' L^2 L^3 three electric conductors uniting the same.

At the transmitting-station A is placed a battery, E, having one pole—say the negative—connected with the earth at G by conductor 1, and the positive pole with the transmitting device K by means of a conductor, 2. The transmitting device K is arranged to transmit electric impulses from the battery E upon the conductors L in succession, either in the order L' L^2 L^3 or in the order L^3 L^2 L' in a manner well understood.

At the receiving-station B are provided three electro-magnets, M' M^2 M^3, respectively, included in the conductors L' L^2 L^3. After traversing the coils of these electro-magnets, the conductors L' L^2 L^3 are united at a point, 3, with a conductor, 1, which is connected with the earth at G'.

The electro-magnets M are each provided with an armature, *m*, and an armature-lever, N. These armatures and their levers are normally held away from the poles of their electro-magnets by suitable retractile springs, *s*. When, however, any one of the electro-magnets is vitalized by a current transmitted from the station A, the armature-lever will be drawn into a forward position, thereby causing a pallet, *o*, mounted at the extremity thereof, to impinge against a tooth of a star-wheel, P, carried upon an arbor, *t*. The teeth *p* of the wheel P are beveled at the same angle upon their opposite faces. The pallets *o*, which engage these teeth, are constructed in the same manner, and their faces form a salient angle approximately equal to the re-entering angle between two adjacent teeth, *p*, and they are of the proper proportions to nearly fill the spaces between the adjacent teeth. The relative positions of the pallets *o* are such that no two pallets can be in a position midway between two consecutive teeth at the same time—that is to say, if one pallet, for instance, *o'*, is midway between two of the teeth *p'* and p^2, neither the pallet o^2 nor o^3 should be in a similar position with reference to any of the remaining teeth. The three pallets are for this purpose so arranged that if all the electro-magnets were simultaneously vitalized the three pallets would impinge upon the respective teeth *p* of the wheel P at three different relative points. Thus if the salient angle of the pallet *o'* were to coincide with a re-entering angle of the

star-wheel P the pallet o^2 would engage a tooth, p^5, for example, at a point intermediate between its base and edge upon one side, and the pallet o^3 would impinge upon the opposite side of a tooth, p^{10}. The relative points thus engaged would be separated approximately one-third the width of a single tooth.

A type-wheel, T, or other device may be mounted upon the arbor t of the wheel P and revolved in one direction or the other, according to the direction of motion imparted to the wheel.

The operation is as follows: Considering the electric impulses to be transmitted from the battery E upon the conductors L in the succession of L′, L^2, and L^3, the electro-magnets M′, M^2, and M^3 will be successively vitalized. When the electro-magnet M′ is vitalized its pallet o' will be forced between two adjacent teeth, p' p^2, causing the wheel P to assume the position indicated in the drawing. The electro-magnet M^2 being next vitalized and the electro-magnet M′ demagnetized, the pallet o^2 will be caused to impinge upon the right-hand face of its adjacent tooth p^5 and effect a movement of the wheel P in the direction indicated by the arrow x', thereby bringing the point which is midway between the teeth p^5 and p^6 into the same radial line as that assumed by the extremity of the pallet o^2. The electro-magnet M^2 being then demagnetized the pallet o^2 is withdrawn, and the pallet o^3 next engages the tooth p^{10} by virtue of the attraction exerted by the electro-magnet M^3. This pallet causes the wheel P to be advanced through a distance equal to one-third the width of the tooth in the same manner as that already described with reference to the pallet o^2. By repeating the electric impulses upon the lines L′, L^2, and L^3 the wheel P may be revolved so long as required.

It is evident that by reversing the order in which the electro-magnets are vitalized the direction of motion of the wheel P may be reversed.

In the drawing I have represented the type-wheel as bearing thirty-six characters and the star-wheel P as having twelve teeth, such proportion being conveniently employed for the purpose of advancing the type-wheel one character for each impulse transmitted; and it is evident that such result will be effected from the fact that the star-wheel P is advanced by each impulse through one-third of the distance occupied by any one of the teeth.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, of a battery, a series of electric conductors, means for completing the circuit of said battery through each of said conductors in succession, and a series of electro-magnets, one included in the circuit of each of said conductors, an armature and armature-lever applied to each of said electro-magnets, a double-faced pawl or pallet carried at the extremity of said armature-levers, and a wheel having a series of beveled teeth against which said pallets are successively caused to impinge.

2. The combination, substantially as hereinbefore set forth, of a star-wheel, a series of electro-magnets, means for vitalizing said electro-magnets in succession, and a series of pallets successively engaging the teeth of said star-wheel, thereby causing the same to be revolved in one direction or the other, according to the order of succession in which said electro-magnets are vitalized.

3. The combination, substantially as hereinbefore set forth, of a star-wheel, a series of pallets, and a series of electro-magnets for causing each of said pallets to engage the teeth of said star-wheel in succession, thereby advancing the same in one direction or the other through a predetermined distance.

In testimony whereof I have hereunto subscribed my name this 25th day of April, A. D. 1883.

HENRY VAN HOEVENBERGH.

Witnesses:
DANIEL W. EDGECOMB,
CHARLES A. TERRY.