

(No Model.)

H. VAN HOEVENBERGH.

ELECTRO MAGNET FOR PRINTING TELEGRAPHS.

No. 316,676.

Patented Apr. 28, 1885.

Fig. 1,

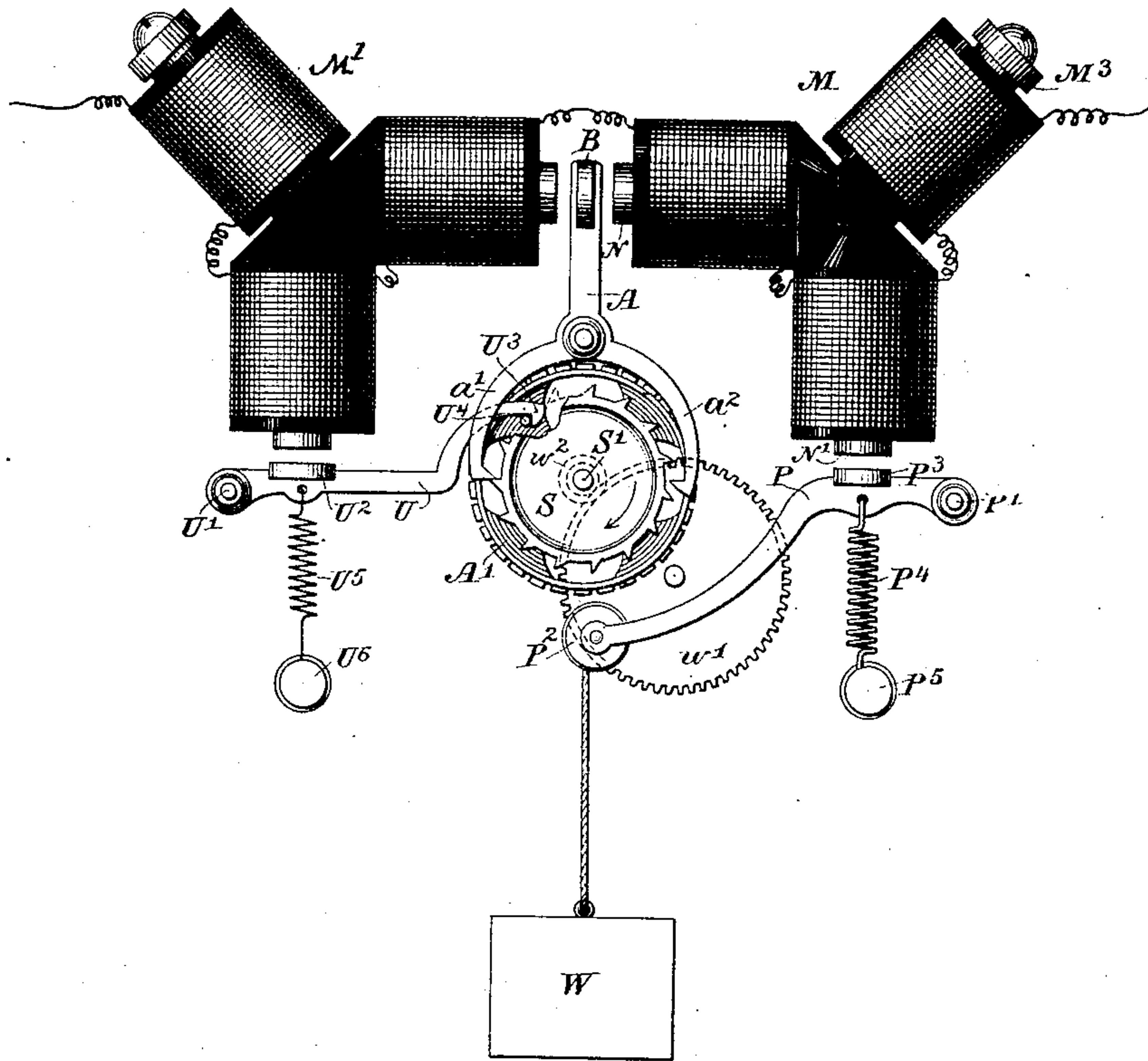
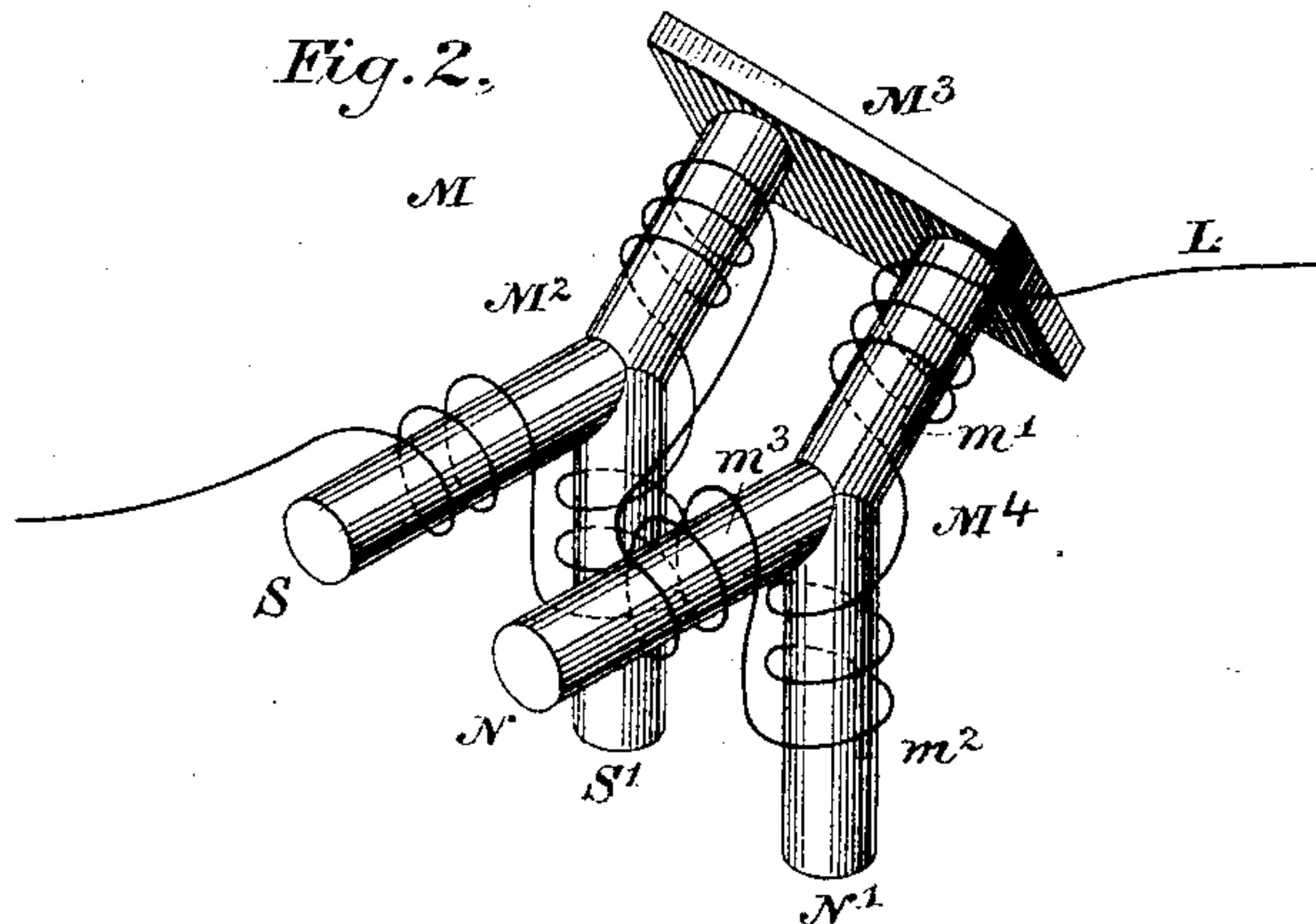


Fig. 2,



WITNESSES

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INVENTOR

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UNITED STATES PATENT OFFICE.

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ELECTRO-MAGNET FOR PRINTING-TELEGRAPHS.

SPECIFICATION forming part of Letters Patent No. 316,676, dated April 28, 1885.

Application filed August 16, 1883. (No model.)

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 Electro-Magnets for Printing-Telegraphs, of which the following is a specification.

My invention relates to the receiving-instruments of printing-telegraph systems. It particularly relates to the electro-magnetic devices employed therein.

The main object of my invention is to improve the form and construction of electro-magnets, especially such as are used in said printing-telegraph instruments, in order that the energy of the electrical currents which traverse the coils of said magnets may be advantageously expended in controlling the position of the type-wheel, in effecting the impression of the type upon the receiving-sheet, and in maintaining the instrument in unison with the transmitter.

The invention consists in constructing electro-magnets with branching limbs severally equipped with helices arranged to develop four poles to each magnet, two of which are preferably employed in actuating the escapement mechanism, the remaining two being employed for actuating the impression-producing device or the unison mechanism.

The invention further includes certain details of construction, and a specific method of operating the unison device.

The exact subject-matter claimed will be hereinafter specifically designated.

In the accompanying drawings, Figure 1 is a front elevation of such part of a printing-telegraph instrument as is necessary to illustrate the invention; and Fig. 2 is a perspective view of one of the electro-magnets, the coils of which are shown theoretically.

Referring to these drawings, A' represents a type-wheel normally urged about its axis in a given direction by means of a weight, W, or other equivalent device acting through suitable intermediate mechanism, which may advantageously consist of a gear-wheel, w' , and pinion w'' .

The advance movements of the type-wheel are controlled by means of an escapement

mechanism consisting of the scape-wheel S, mounted upon the type-wheel shaft S', the pivoted anchor A, provided with pallets a' and a'' , engaging in the teeth of said scape-wheel, a polarized armature, B, carried by said pivoted anchor, and vibrating under the influence of polar changes in the magnets, to be hereinafter described.

M M' are two magnetic systems similar to each other in construction. It will therefore suffice to describe the magnet M. The core of this magnet is composed of two limbs, M^1 M^2 , united by a common yoke-piece, M^3 . Each limb is made up of three divisions, m^1 m^2 m^3 , branching from a common center. The yoke-piece M^3 connects the divisions m^1 with each other. The line-conductor L is wound first about the branches of one limb successively, and then about the branches of the other. The winding (see Fig. 2) is such that a current traveling in one direction will develop the poles respectively represented by the letters N N' S S'. These poles will be respectively reversed by a current of opposite direction. Both magnetic systems M and M' are included in the circuit of the main line L, either in series or in multiple arc, as may be desired. The former is the plan shown in the figures. The poles N S of the magnet M confront the polarized armature B on one side, while corresponding poles of the magnet M' confront it upon the opposite side. The passage of intermittent currents of opposite polarity through the line-wire L cause the oscillation of said polarized armature, and thus control the escapement of the type-wheel in a manner which will be understood by those versed in the art. The poles N' S' of the magnet N are employed to actuate an impression-producing mechanism, which may consist of a printing-lever, P, fulcrumed at P', and carrying a platen, P², and armature P³, the latter confronting the poles N' S', and normally held away from said poles by the action of the spring P⁴. The retractile force of this spring is regulated by turning the screw P⁵. It should be so adjusted as to prevent the actuation of the printing mechanism in response to the short intermittent currents which control the escapement of the type-wheel. The printing-lever should respond, however, to currents of increased du-

ration, though of the same strength as those which actuate the armature B. As the armature P^3 is not polarized, it will respond to such increased currents regardless of their polarity.

5 In order that the printing-lever may be actuated by pauses of definite length only in the alternating currents, suitable retarding mechanism may be applied in addition to the spring P^4 , which will help to prevent the lever from
10 answering the short alternating currents that effect the escapement of the type-wheel

The poles N' S' of the magnet N are employed in actuating the unison device, which consists of an armature-lever, U , fulcrumed
15 at U' and carrying the armature U^2 , and at its extreme end the detent U^3 , the office of which is to arrest the type-wheel in position to print blank by engaging with a suitable stop, U^4 , upon said type-wheel. The ar-
20 mature-lever U is normally held against the poles N' S' of the magnet N by virtue of the magnetism developed in said poles by the passage of the alternating currents. The retractile spring U^5 is accordingly adjusted by
25 means of the screw U^6 to exert but a feeble pull upon the armature U , and therefore notwithstanding the reversals of magnetism it remains against said poles.

As before described, I use alternating currents normally having enough strength to operate the printing-lever if prolonged for a sufficient time. Such strength is, however, greater than that necessary to oscillate the armature B , which is polarized and not opposed
35 by any spring-power.

To actuate the unison device, I decrease the strength of the alternating currents to a strength which does not actuate the printing device, and which continues to operate the
40 escapement device, but which cannot oppose the spring U^5 . The armature-lever U will then be withdrawn, the detent U^3 will come into the path of the stop U^4 , and the type-wheel will be arrested in position to print
45 blank.

The transmitting apparatus which is to be operated in connection with these devices forms no part of the subject-matter of this application. It may be of any convenient form
50 adapted to transmit over the circuit the necessary electrical conditions for actuating the mechanism above described.

I claim as my invention—

1. The combination, substantially as here-

inbefore set forth, of an electro-magnet consisting of a yoke-piece, two main cores united by said yoke-piece, each of said cores having two arms branching therefrom, an escapement device acted upon by one pair of said arms, and an impression-producing device acted upon by the remaining pair of said arms.

2. The combination, substantially as hereinbefore set forth, with an electro-magnet consisting of a main core having branches, and magnetizing-coils respectively surrounding
65 said main core and its branches, of an escapement device applied to one or more of said branches and a unison device applied to the remaining branch or branches.

3. The combination, substantially as hereinbefore set forth, of the two compound electro-magnets developing four sets of poles, the escapement operated by the joint action of two of said sets, an impression-producing mechanism actuated by one of the remaining
75 sets, and a unison device operated by the action of the other of the remaining sets.

4. The combination, substantially as hereinbefore set forth, of a type-wheel, an escapement device, an arresting device for stopping
80 said type-wheel at the unison-point, an electro-magnet, which when traversed by alternating currents of the strength normally employed for actuating said escapement device restrains said arresting device from action,
85 and which when traversed by currents of lesser but determined strength allows said arresting device to act.

5. In a printing-telegraph instrument, the combination, substantially as hereinbefore set forth, of a type-wheel, means for normally advancing said type-wheel through the agency of electric currents of a given strength, a unison-detent, and means, substantially such as described, operated through the agency of
95 currents of less strength for permitting said unison-detent to move into a position to arrest said type-wheel and for simultaneously advancing said type-wheel until it is arrested by the detent.

In testimony whereof I have hereunto subscribed my name this 31st day of July, A. D. 1883.

HENRY VAN HOEVENBERGH.

Witnesses:

DANIEL W. EDGECOMB,
CHARLES A. TERRY.