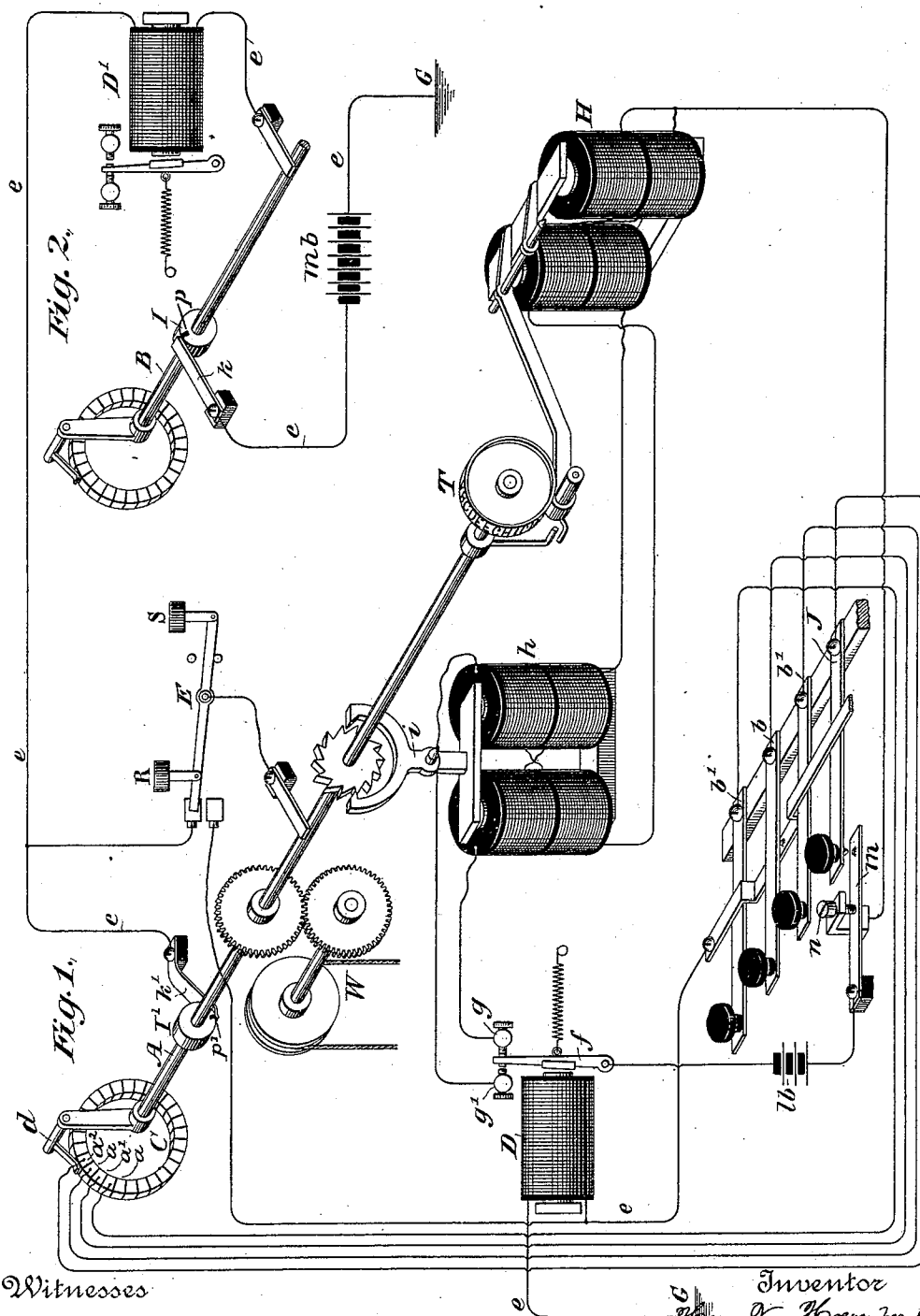


(No Model.)

H. VAN HOEVENBERGH.
UNISON APPARATUS FOR PRINTING TELEGRAPHS.

No. 472,237.

Patented Apr. 5, 1892.



Witnesses

C. E. Ashley
14. W. Lloyd.

Inventor

Inventor
Henry Van Noordenburgh
By his Attorney
Franklin L. Pope.

UNITED STATES PATENT OFFICE.

HENRY VAN HOEVENBERGH, OF NEW YORK, N. Y.

UNISON APPARATUS FOR PRINTING-TELEGRAPHS.

SPECIFICATION forming part of Letters Patent No. 472,237, dated April 5, 1892.

Application filed July 20, 1891. Serial No. 400,003. (No model.)

To all whom it may concern:

Be it known that I, HENRY VAN HOEVENBERGH, a citizen of the United States, residing at New York, in the county and State of New York, have invented a certain new and useful Improvement in Unison Apparatus for Printing-Telegraphs, of which the following is a specification.

My invention relates to that class of printing-telegraphs in which a type-wheel shaft is driven or controlled step by step by a succession of pulsations or currents derived from a transmitting apparatus; and the object of my improvement is to provide means whereby the transmitting-operator by the automatic action of his own apparatus may be informed whenever the type-wheel of the receiving-machine is out of correspondence or "unison" and, furthermore, to provide means of quickly restoring the correspondence or unison of the transmitting and receiving machines.

In the unison devices hitherto in use the type-wheel of the receiving-instrument has been held by a detent at the unison-point until the transmitting-shaft has arrived at the corresponding point, when it has been released and the two started together. In my improved unison movement I reverse this mode of operation—that is to say, I arrest the transmitting-shaft, together with its circuit-wheel and attachments, at the unison-point and hold it there until the type-wheel of the receiving-instrument has been brought to the corresponding point, when the release is effected by appropriate means.

I have herein shown my improvement as applied to a certain printing-telegraph apparatus for which Letters Patent were issued to me June 30, 1891, No. 455,075; but I remark that my invention may be applied with equal advantage to any step-by-step printing-telegraph in which only one receiving-instrument is designed to be operated by the transmitter at the same time.

In the accompanying drawings, Figure 1 is a theoretical diagram of a transmitting apparatus embodying my invention, and Fig. 2 is a similar diagram of a receiving apparatus.

In Fig. 1 of the drawings, A represents the main shaft of a printing-telegraph instrument of this class, with its commutator C, break-wheel I', power connection W, escapement *i*, type-wheel T, and press-magnet H.

B, Fig. 2, shows the shaft of another machine, precisely similar to the first, except that the last three elements are omitted for the sake of simplicity, as they are in all respects like those of the shaft A.

In the commutator C *a*, *a'*, and *a*² are metallic segments separated by narrow non-conducting spaces and respectively connected by independent wires to a corresponding group of keys *b b'*, &c. As shown, all the segments lettered *a* are normally open at the keyboard, while the alternate segments lettered *a'* are normally closed. When the contact device or trailer *d* rests upon an open segment, the line-wire *e e e*, which is supplied with current from the main battery *mb*, is open, and hence the armature *f* of the relay D falls upon its rear stop *g*. The shaft A, by the action of the local battery *lb*, electro-magnet *h*, and escapement *i*, then advances one step, carrying with it the trailer *d* and causing the same to rest upon a closed segment. The main-line circuit *e e e* is now closed, the armature *f* of the relay D is drawn against its front stop *g'*, and the escapement *i* allows the shaft A to revolve another step, which brings the trailer *d* again upon an open segment *a*. The successive repetition of this operation therefore results in a continuous progressive revolution of the shaft A, as more fully described in my former patent hereinbefore referred to. In an apparatus thus organized if any one of the keys *b* or *b'* be depressed the shaft A revolves and the trailer *d* advances until it reaches the segment connected to the depressed key, when the revolution is arrested until the key is released. If the particular key depressed happens to be a normally-open-circuit key, (which by the act of being depressed is converted into a closed-circuit key,) the succession of impulses sent to line by means of the series of actions just described will be interrupted, leaving the circuit closed upon the main line *e e*. While the said key is still depressed if the main circuit should be opened at any other point and closed again the trailer *d* will be permitted to escape from the segment upon which it rests, and its progressive movement will continue, even though the key be still held down. I avail myself of this circumstance to effect the automatic correction or unison of my improved machine. There is upon the type-wheel a blank space, which occupies the place of one of the characters cor-

responding to an open-circuit segment. The key J connected to this segment is a normally-closed key, and hence when depressed interrupts the otherwise orderly succession of alternately open and closed circuit keys. When the trailer *d* reaches the corresponding segment *a*², the rotation of the shaft A would be arrested and further progress stopped, precisely the same as if any other open-circuit key had been depressed if no provision existed to produce a different result. By tracing the main-line circuit *e e e* to the receiving-instrument (shown in Fig. 2) it will be seen that the main-line circuit *e e* is carried through a metallic disk I on the shaft B of the instrument, which is provided with one insulated point P, against which presses a contact-spring *k*. This disk and spring are so adjusted that the main circuit is interrupted for a time equivalent to that occupied by the passage of the trailer over one segment at the same instant of time that the shaft of the transmitting-instrument would otherwise be arrested by reason of the trailer *d* resting upon the closed-circuit segment *a*², connected with the key J in Fig. 1. The rotation of the sending-shaft A therefore proceeds uninterrupted, the receiving-instrument opening the circuit at P synchronously with its closure at *a*² by the transmitting-instrument. This operation necessarily takes place only once during each complete revolution of the respective shafts. Now if from any cause the receiving-instrument should "throw out" or fall out of correspondence with the transmitting-instrument the break P on the disk I, Fig. 2, would fail to pass under the spring *k* at the proper time, the main-line circuit would not be interrupted, and hence the rotation of transmitting-instrument would be instantly arrested. The transmitting-operator would thus become aware that his apparatus had stopped, although he had no key depressed. This would notify him that the receiver had fallen out of unison. Having been previously instructed, he would depress the key J, thereby breaking the main-line circuit, and simultaneously therewith the circuit of the local battery *lb*, by means of the spring *m* and contact *n*. This prevents the transmitting-shaft from starting (as it would otherwise do) by the opening of the main-line circuit. The interruption of the main-line circuit advances the receiving-shaft B, Fig. 2, one step and its closing (when key J is released) another step. If this is all the adjustment necessary to bring the two shafts into unison, the transmitting-shaft will start as soon as the key J is released. If not, the operator must depress the key J as many times successively as may be necessary until the two are brought together, when the regular rotation will commence and continue, as before.

As a matter of convenience it is preferred that the transmitting and receiving instruments be made exactly alike, so that either

may be used for sending or receiving at will. A switch E, Fig. 1, provided with buttons marked S (send) and R, (receive,) determines which operation it shall perform. When in the position shown in the drawings, S being depressed, instrument Fig. 1 will transmit and instrument Fig. 2 will receive. When it is desired to reverse the operation, the button R is depressed. This cuts out the transmitting portion of instrument Fig. 1, consisting of the segment-disk C and its attachments, at the same time cutting in the break-wheel *l'* and spring *k*. Thus either instrument may become a transmitter or receiver at will.

In adapting my improved unison system to a printing-telegraph operated by reversals it is only necessary to arrange the circuit-wheel so that one reversal is intermitted, the main line being put to earth after going through the main-line relay. The receiving-instrument will then send out an impulse of the appropriate polarity to take the place of the intermitted impulse of the transmitter. The operation in other respects would be precisely the same as that hereinbefore described.

I claim as my invention—

1. In a printing-telegraph, the combination, with a main-line circuit, of a step-by-step transmitter organized to drop or intermit one of a series of breaks or impulses and a receiving-instrument organized to supply the break or impulse omitted by the transmitter, substantially as set forth.

2. In a printing-telegraph, the combination, with a main-line circuit, of a step-by-step transmitter organized to drop or intermit one of a series of impulses or breaks, a receiving instrument organized to supply the break or impulse omitted by the transmitter, and means, substantially such as described, for rotating the receiving-instrument independently of the the transmitter, substantially as set forth.

3. The combination, with the main circuit *e e*, of the key J, locking-segment *a*², electrically connected therewith, trailer *d*, break-wheel I, contact-spring *k*, and electro-magnet *h*, substantially as set forth.

4. The hereinbefore-described method of effecting the unison of the transmitting and receiving parts of a printing-telegraph, which consists in first locking the transmitting-shaft at a predetermined point in its revolution, then advancing the type-wheel shaft of the receiving-instrument until the type-wheel has been brought to the corresponding point, and finally releasing the transmitting-shaft by the action of said type-wheel shaft, substantially as set forth.

In testimony whereof I have hereunto subscribed my name this 11th day of July, A. D. 1891.

HENRY VAN HOEVENBERGH.

Witnesses:

FRANKLIN L. POPE,
CAROLINE E. DAVIDSON.