H. VAN HOEVENBERGH.

Improvement in Printing-Telegraphs.

.No. 130,831. Patented Aug. 27, 1872.

Fig. 2.

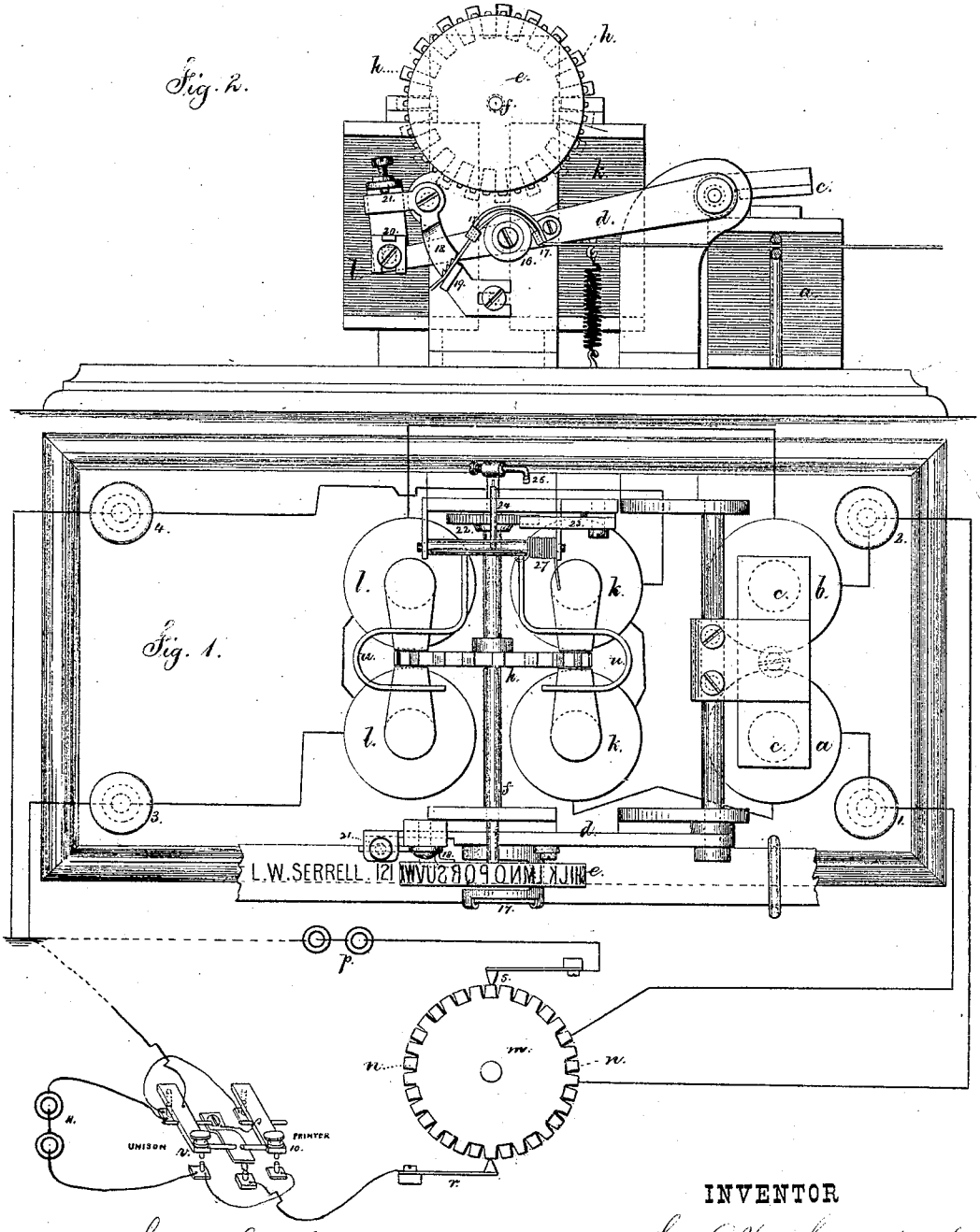

Fig. 1.

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Witnesses.

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Henry Van Hoevenbergh,
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ATTY

A.M. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS)

UNITED STATES PATENT OFFICE.

HENRY VAN HOEVENBERGH, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN PRINTING-TELEGRAPHS.

Specification forming part of Letters Patent No. **130,831**, dated August 27, 1872.

To all whom it may concern:

Be it known that I, HENRY VAN HOEVENBERGH, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Printing-Telegraphs, of which the following is a description:

In this telegraph there is an armature-wheel having armatures and intermediate spaces, and serving as a motor and a holder or stop to the type-wheel. The number of characters or spaces upon the type-wheel corresponds with the number produced by multiplying the number of armatures by the number of electro-magnets. The electro-magnets are energized alternately or in succession, and the pulsations keep up a continued revolution of the type-wheel; but when the current is not broken in one of the magnets the type-wheel is stopped thereby and held until the current is broken and the pulsation sent to the next electro-magnet. A ratchet-wheel and pawl prevent the type-wheel being moved backward or in a wrong direction. The printing is effected by sending through both helices of a magnet simultaneous pulsations; but said printing-magnet is not operative while the type-wheel is being turned, because the cores in the two helices are not magnetized at the same time, and the power hence is insufficient to move the armature. To bring all the type-wheels of the instruments on a circuit into unison a swinging bow is attracted by energizing both type-wheel magnets and then alternating the pulsations, the bow being held by first one magnet and then the other; and this bow stops the further rotation of the type-wheel at the unison-point. The unison-bow is liberated by opening both circuits, which has also to be done after printing, to allow the parts to resume their normal position. The paper is held by a stationary clamp while the printing-lever is moved; hence the paper is drawn along by that act.

In the drawing, Figure 1 is a plan of the instrument, and Fig. 2 is a side view of the same.

The printing-magnet is made of the coils or helices *a b*, with their cores, as usual. The armature *c* and lever *d* effect the printing. The type-wheel *e* is upon the shaft *f*, which also, preferably, carries the armature-wheel *h*. The armature-wheel might be upon a separate shaft, geared to the type-wheel shaft. The armature-wheel is made with the required number of armatures to form both a motor and a stop or holder to the type-wheel. I prefer to employ an armature-wheel made with radial armatures revolving between the poles of two electro-magnets, as shown; but there might be more than two electro-magnets, and the armatures may be arranged cylindrically or conically and the electro-magnets be placed around the wheel. In either case the electro-magnets act as motors and holders to the type-wheel without the intervention of levers or escapements or pallets; and the number of spaces or characters on the type-wheel is a multiple of the number of the armatures and electro-magnets. The pairs of helices *k k* and *l l* and their respective cores compose the type-wheel magnets, and the helices *k* are in the same circuit as the helix *a*, and the helices *l* are in the same circuit as the helix *b*, as seen in Fig. 1. The binding-screws 1 2 3 4 receive the respective wires, the screws 1 2 being for the line-wires connecting to the pulsator, and the screws 3 4 receiving the wires to the next instrument or to the earth-circuit. I have shown a circuit-changer composed of the toothed disks *m n* with the circuit-closer 5 to the battery *p*. This circuit-changer is revolved by suitable means and sends a current from *p* alternately through *k a* and *l b*, actuating the armature-wheel and type-wheel with whatever rapidity of revolution is given to the disks *m n*; and when the disks are stopped the type-wheel is held firmly by the magnet that is energized acting upon the wheel-armature that is contiguous thereto. The ratchet-wheel 22 and pawl 23 prevent the type-wheel revolving backward when started, and the parts are so positioned that the armature-wheel is stopped with the armature that is next to be attracted slightly nearer to its core, so as to be operative in renewing the revolution. To effect the printing it is only necessary to energize the other core, *a* or *b*, one helix and core being insufficient to move the printing-lever. To effect this I employ a contact-spring, *r*, key 10, and connections to the battery 11; so that on sending a current by closing the key 10 the printing will be effected. In this case care must be taken to make the connections, so that the polarity in the electro-magnets *a b* is the same. It will be evident that the circuit closed by the key, although going through the other

magnet *k* or *l*, will not move the type-wheel, because the magnet at which the type-wheel was stopped exerts the superior force upon the armature that is contiguous thereto. Both circuits are broken to relieve the printing-lever after the impression. The printing-lever *d* is provided with the impression-pad 16, and the paper is guided at 17 and passes nearly vertically between the holding-pawl 18 and finger 19, so that as the printing-pad is moved toward the type-wheel the paper is drawn along over the pad 16 in consequence of being held at 18 19. The pawl 18 swings, and by the stop 20, on the printing-lever, is turned back from the paper just before the impression is made, and, by the stop 21, is pressed back again into contact with the paper as the printing-lever completes its downward movement, the paper having slidden freely, by gravity, between 18 and 19, during that downward movement. Upon the type-wheel shaft *f* is an arm, 26, and a hinged bow, *n*, is provided with an arm, 24, that ordinarily is kept from contact with the said arm 26 by a spring, 27; but when both magnets *k l* are energized the force is sufficient to draw down the bow *n*, one magnet alone being insufficient. In this condition the magnets *l k* are alternately energized to move the type-wheel around until arrested by the unison-arm 26 stopping against 24. Each one of said magnets retains the bow by its own magnetism until the next magnet is energized. It is desirable that the printing-magnet should not be energized when the bow is attracted by the magnets *k l* when setting the instruments at unison. For this purpose a reverse current is sent through the key *v*, which is effective in attracting the bow *n*, but is neutral in operating the printing-lever.

I claim as my invention—

1. An armature-wheel revolved by electro-magnets, and arrested by either of the electro-magnets when its circuit is not broken, in combination with a type-wheel and printing mechanism, substantially as set forth.

2. An electro-motor composed of two electro-magnets in separate circuits, in combination with a printing-magnet the helices of which are in the same circuits as the motor-magnets, substantially as specified.

3. The printing-lever and impression-pad, in combination with a holding-pawl, operated, substantially as set forth, for drawing the paper over the pad by the movement of the printing-lever.

4. The unison mechanism, first operated by the joint action of the two electro-magnets that revolve the type-wheel, and held in operation by either of the magnets as alternately energized, substantially as set forth.

5. An electro-magnet with the two helices or coils in separate electric circuits, which circuits are separately employed for different operations, but jointly to operate the said electro-magnet, substantially as specified.

Signed by me this 18th day of July, A. D. 1872.

HENRY VAN HOEVENBERGH.

Witnesses:
GEO. T. PINCKNEY,
CHAS. H. SMITH.