2 Sheets—Sheet 1.

A. A. KNUDSON.

PRINTING TELEGRAPH.

No. 183,462. Patented Oct. 17, 1876.

FIG. 1.

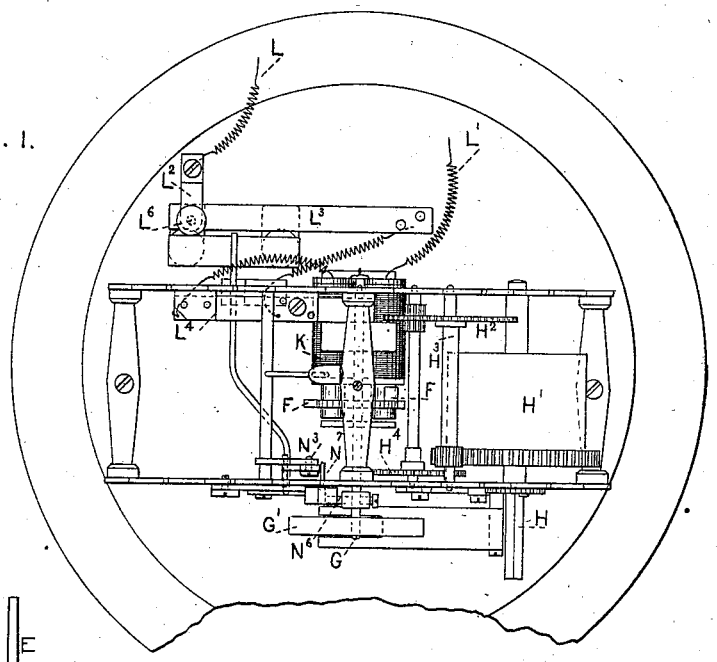


FIG. 8

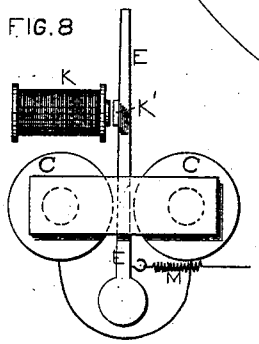
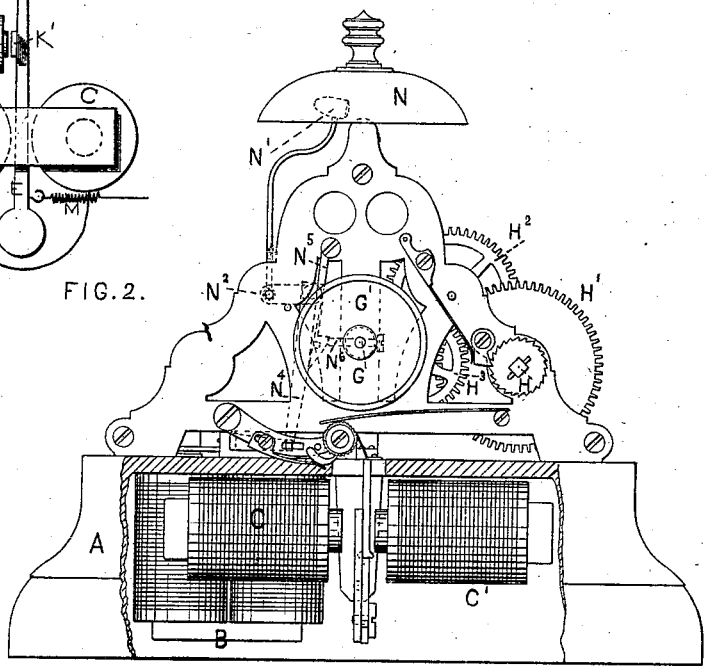


FIG. 2.



WITNESSES.

Thos W. Capen.

Chas Fontayne

Adolphus A. Knudson

INVENTOR.

2 Sheets—Sheet 2.

A. A. KNUDSON.

PRINTING TELEGRAPH.

No. 183,462. Patented Oct. 17, 1876.

FIG. 3.

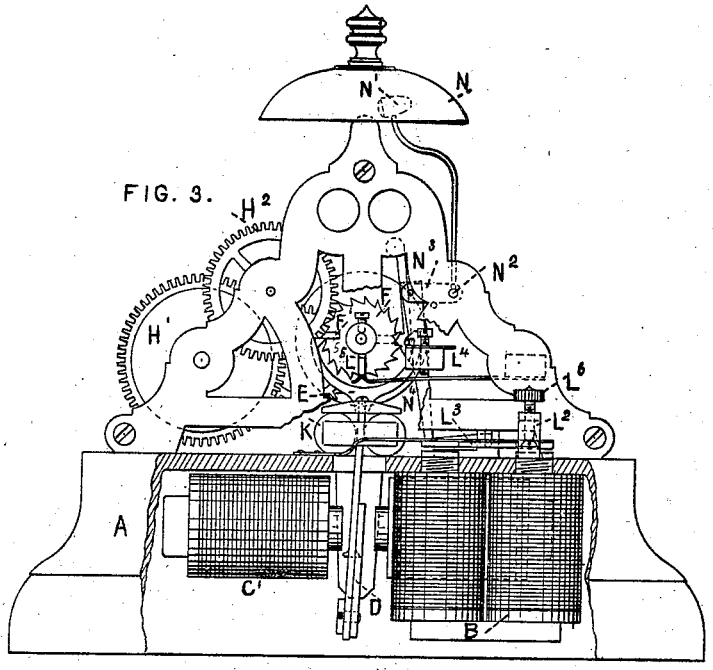


FIG. 4.

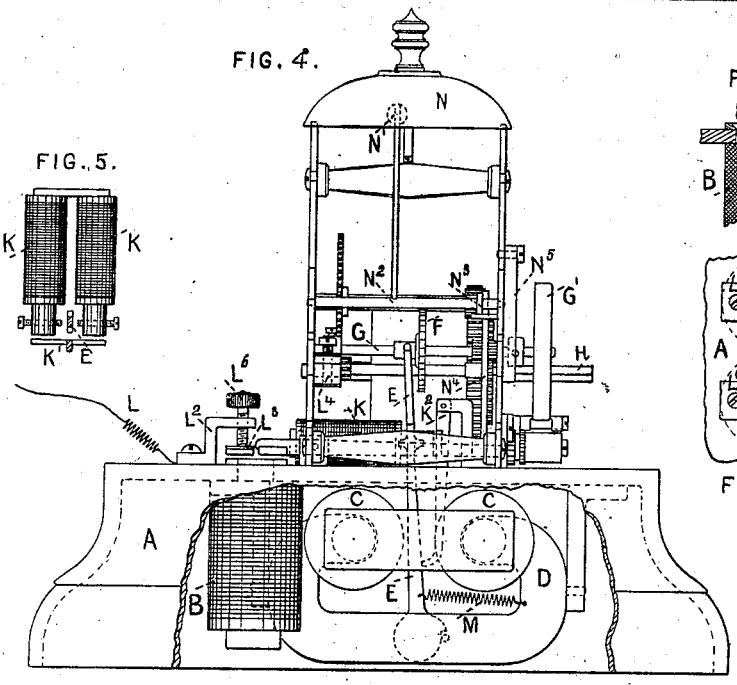


FIG. 5.

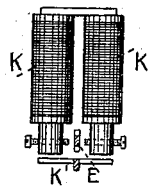
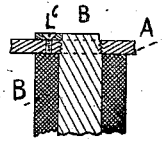


FIG. 6.



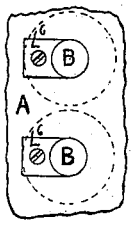


FIG. 7.

WITNESSES

Thos W. Capen.

Chas P. Fontayne

Adolphus A. Knudson,

INVENTOR.

UNITED STATES PATENT OFFICE.

ADOLPHUS A. KNUDSON, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE GOLD AND STOCK TELEGRAPH COMPANY, OF NEW YORK CITY.

IMPROVEMENT IN PRINTING-TELEGRAPHS.

Specification forming part of Letters Patent No. **183,462**, dated October 17, 1876; application filed February 1, 1876.

To all whom it may concern:

Be it known that I, ADOLPHUS A. KNUDSON, of the city of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Printing-Telegraphs, of which the following is a full and exact description, reference being had to the accompanying drawings.

Figure 1 is a plan of the apparatus from the top. Fig. 2 is a side elevation, with a section of the base, to show the magnets underneath it. Fig. 3 is a side elevation, from the opposite side shown in Fig. 2, and with a section of the base also. Fig. 4 is an elevation from one end of the frame, with a section of the base. Figs. 5, 6, and 7 represent certain views in detail. Fig. 8 is a modification of one portion of the instrument.

This invention pertains to the class of printing-telegraphs which have the type-wheels driven by a train of gearing and a weight or spring, or some other motor, and in which the type-wheels of the several instruments in the circuit must be brought into the same position at rest, or what is termed "unison" with each other and with the transmitter; and this invention consists of a novel combination and arrangement of parts, which will be fully hereinafter described, and specifically pointed out in the claims, a preliminary description being deemed unnecessary.

At A is represented the base of the apparatus, on the under side of which are supported the electro-magnets—one pair in a vertical position, as at B, for operating the printing or press lever, and two pairs in a horizontal position, as at C and C′, for operating the type-wheel. Between these last two pairs of magnets is mounted a polarized armature, as at D, to which is attached an escapement-lever, as at E, which extends up through the base A, and is forked at its upper end, and provided with pallets to engage with an escapement-wheel, as at F, on the type-wheel shaft G, the type-wheel being shown at G′. These several magnets are all connected with the main circuit, and the several parts thus mentioned are well known, and are embraced in a previous patent to me.

The driving-train or motor, also shown at H, where the main stem for winding up the spring or weight attached to the main cylinder H^1 is, and second wheel H^2, and intermediate shaft and wheels H^3 and H^4, where it connects with a pinion on the type-wheel shaft, are all old and well-known devices, and therefore need not further be described in this specification. But it will be observed that in this improvement the pallet or escapement lever E is attached to the armature D by a pivotal connection at a right angle to the plane of the armature, but in the plane of the pallets and the escapement-wheel, so that said lever can vibrate to and from the plane of said wheel when desired. Now, it is manifest that if the motor-train be in action upon the type-wheel shaft, and the pallets be drawn out of contact with the teeth of the escapement-wheel, the type-wheel will begin to run instantly and freely, and continue until the motor is checked. A stop is therefore attached upon the side of the escapement-wheel, as at F′, or it may be placed on the shaft G, but is so arranged relatively to the teeth of the escapement-wheel that when the pallets are disengaged therefrom said stop will, in less than one revolution of the escapement-wheel, come in contact with the end of the pallet-lever, and thereby stop the rotation of the type-wheel. The method of disengaging the pallets from the escapement-wheel in the present case is by the use of a small electro-magnet, as at K, between the poles of which the pallet-lever is placed, and on the opposite side is the armature, as at K^1, fastened upon a lever, K^2, (see Fig. 4,) the free end of which rests against the side of the pallet-lever, and in such a position as that when the armature K^1 is attracted to the magnet K the pallets will be forced out of contact with the escapement-wheel, and it will be permitted to run freely and quickly until the stop F′ strikes the end of the pallet-lever or some projection thereon. This operation is accomplished automatically by the use of a small local battery, the wires to which are shown at L L^1, one of which is attached to a bracket, as at L^2, on the top of the base, where, through a vibrating tongue, as at L^3, its connection is made to an insulated brake, as at L^4, one end

of which brake is arranged to come in contact with a pin, L^5, on the type-wheel shaft. The other wire, L^1, from the battery is connected directly to the magnet K.

Said vibrating tongue L^3 is simply a piece of brass fastened upon the top of the base, and is not an armature, but is provided with a facing of soft iron at one or more points on its under side, to come in contact with projecting poles from the press-magnet, as at L^6, (see Figs. 6 and 7,) and by which the tongue is drawn down toward the press-magnet, (whenever the main circuit is working,) and out of contact with the regulating-screw L^6, which is mounted in the bracket L^2, and to which one of the wires, as already stated, is attached; consequently, when the said tongue is held upon the press-magnet or the projections therefrom, the circuit between the local battery and the magnet K, for disconnecting the pallets, is broken, and therefore the pallets are held in working position by the spring at M under the base A. (See Fig. 4.) When, however, the main circuit is broken, and the press-magnet ceases to hold the vibrating tongue L^3 down, then it rises in contact with the regulating-screw L^6 and closes the local circuit, and thereby instantly draws the pallets out of contact with the escapement-wheel on the type-wheel shaft, and the type-wheel instantly begins to revolve freely and quickly, being driven by the motor-train. But in less than one revolution the stop on the escapement-wheel comes in contact with the end of the pallet-lever, and the type-wheel stops. At this instant the pin on the type-wheel shaft strikes the end of the brake-piece at L^4, which is curved up slightly at its point, and thereby acts as a cam against the pin to press the brake-piece down and break the local circuit, which, when done, permits the spring M to draw the pallets instantly again into contact with the escapement-wheel, and ready for work, and thus the instrument is brought to unison or the same point of rest instantly and automatically by the simple co-operation of these devices.

It is evident that the vibrating tongue L^3 may be operated by the escapement-magnets instead of the press-magnets, as herein described, or it may be operated by any other magnet in the main line.

It is evident that the armature acted on by the magnet K, and controlling through the medium of lever K^2 the relation of the escapement-lever and escape-wheel, may be placed directly on the escapement-lever, as shown in Fig. 8, in which case the magnet K may, if desired, be a single-spool magnet.

Another improvement in this apparatus consists in the combination of certain devices with the type-wheel shaft, by which a bell may be struck from the sending-station upon each one of the instruments in the circuit, in order to call attention in the change of the reports, or to strike the time of day, if desired. This is accomplished by mounting a bell, as at N, upon the top of the frame, and placing a hammer, N^1, on a rock-shaft, N^2, and upon one end of the said shaft a lever, N^3, to the outer end of which is suspended by a pivot a pendent stud, N^4, the lower end of which hangs in close proximity to the press-lever on the inner side of the frame. On the outside of the frame, and pivoted thereto, is another pendent arm, as at N^5, at or near the lower end of which is a triangular projection, which serves as a cam, to be operated upon by a pin, as at N^6, in the type-wheel shaft, and which is caused to vibrate backward from the shaft whenever the pin strikes said beveled end. In the inner side of said pendent arm there is a pin, as at N^7, which extends through the frame and in front of the pendent stud N^4, so as to press said stud back over the press-lever, and hold it there when desired. Now, at the proper time to sound the bell, the type-wheel or its shaft is revolved, to bring the pin N^6 on the shaft against the pendent arm N^5, and thereby press back the pendent stud N^4 on its lower end directly over the lever of the press-magnet, and there hold it until the press-lever can be operated as many times as it is desired to strike the bell. When finished, the instrument may return to unison again, as already described, and by the same mechanism.

Having thus fully described my invention, I desire to, and do, claim—

1. In a printing-telegraph, the combination, with the motor-driven train, a type-wheel, and an escape-wheel, both rigidly secured to a shaft, of a pallet or escapement lever of an electro-magnetic escapement, and an electro-magnet operating to disengage the lever from the escape-wheel, and allow both the type and escape wheels to be turned freely and instantly to a designated point by the driving-train, substantially as described.

2. The combination, with the escapement-lever, of a magnet and a local circuit therefor, controlled by the main circuit, and operating to disengage the escapement or pallet lever, and rigidly-attached escape and type wheels, substantially as described.

3. The combination, with the pallet or escapement lever, of two electro-magnets, one controlling the action of the lever upon the escape-wheel, and the other its position in relation thereto, substantially as described.

4. The combination, with the pallet or escapement lever, arranged to engage with or be disconnected from an escape-wheel, of a stop on the type-wheel, or shaft thereof, arranged to take against the pallet when the same is disengaged, and simultaneously stop the type and escape wheels at the desired point, substantially as described.

5. The combination, in a printing-telegraph, of a circuit-breaker with the type-wheel, or its shaft, and an electro-magnet, whereby the escapement mechanism may instantly and automatically return to its working position, substantially as described.

6. The combination of the electro-magnet

K, its armature and lever, and a local circuit, and local circuit operated by the main circuit, for throwing the pallets out of and into contact with the escape-wheel, substantially as described.

7. In a printing-telegraph, the escapement or pallet lever, having two pivotal bearings at right angles to each other, and independently operated, substantially as described.

8. The combination of the circuit-breaker L^5 on the type-wheel shaft with the break-piece L^4 of the local circuit, whereby the escaping mechanism is permitted to return to its proper working position, as described.

9. The combination of the vibrating tongue L^3 with, and arranged in, the local circuit and magnet K, for controlling the relative position of the escapement or pallet lever and escape-wheel, the vibrating tongue holding the local circuit open when the main circuit is working, thereby allowing the lever and wheel to be held in engagement, substantially as described.

10. In a printing-telegraph, the bell N, hammer N^1, shaft N^2, arm N^3, pendent N^4, pendent arm N^5, and pin N^6 on the type-wheel shaft, for giving signals, substantially as described.

ADOLPHUS A. KNUDSON.

Attest:

THOS. W. CAPEN,
CHAS. FONTAYNE.