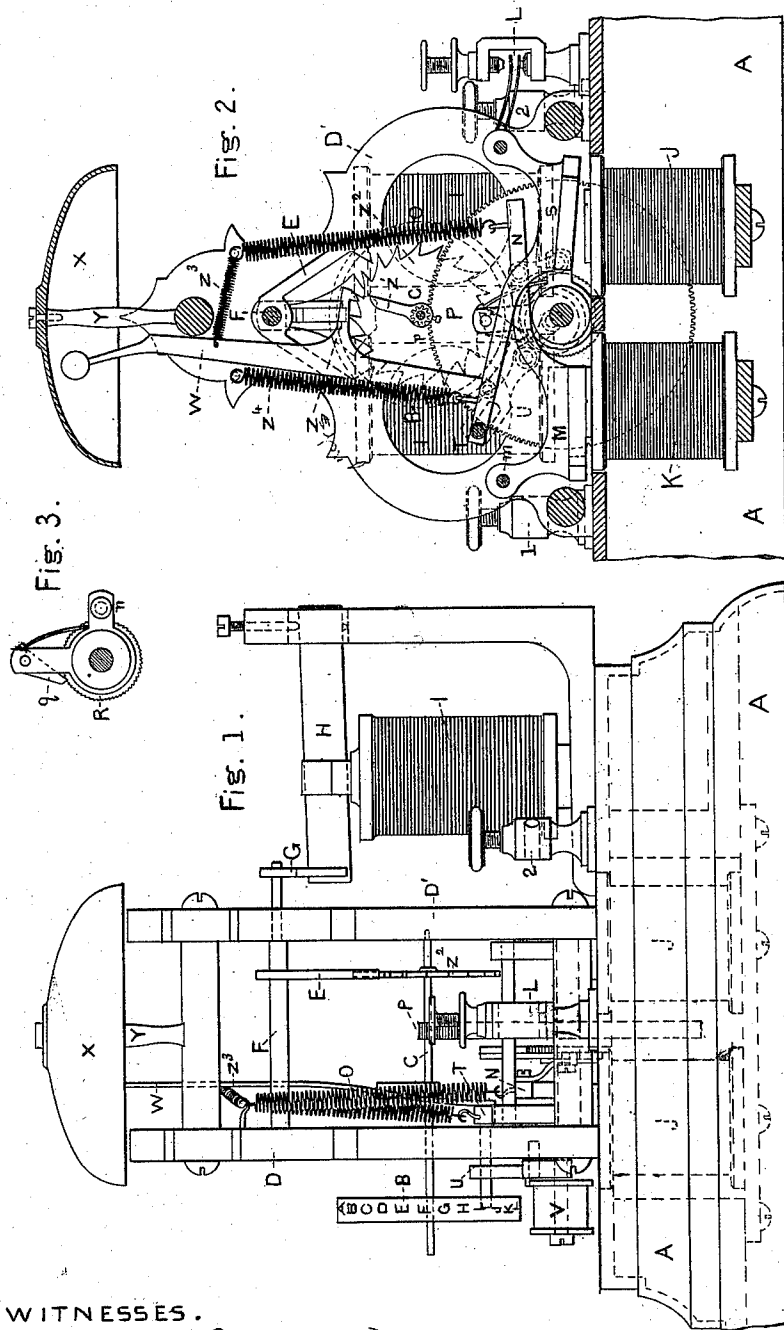


A. A. KNUDSON.  
Printing Telegraphs.

No. 140,143.

Patented June 24, 1873.



WITNESSES.

*Engene N. Eliot*  
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# UNITED STATES PATENT OFFICE.

ADOLPHUS A. KNUDSON, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN PRINTING-TELEGRAPHS.

Specification forming part of Letters Patent No. 140,143, dated June 24, 1873; application filed May 15, 1873.

*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 Improvements in Printing-Telegraphs, of which the following is a specification:

This invention pertains to that class of devices used for receiving and recording automatically letters or characters upon a strip of paper, which is caused to move between a type-wheel and a presser by suitable mechanism under the control of the operator, and by which messages are received and recorded by as many of said instruments as are placed in the telegraphic circuit; and the invention consists, first, in the use of an independent pair of electro-magnets placed in the same circuit as the press or printing magnets, if only one wire is used, and so combined with suitable mechanism in the apparatus as to employ their power in winding up a spring or weight when their circuit is closed, so that the reactive force of said spring or weight shall revolve the type-wheel whenever permitted to revolve by the vibrations of the escapement, which is controlled or regulated by a pair of pole-changing magnets under the control of the operator; and, second, the invention consists in the combination, with such an apparatus, of a bell and striking mechanism operated by the press or printing magnets, and in synchronism with the type-wheel, so that the operator may at a desired point in the revolution of said type-wheel cause signals to be given by striking the bells, or as many as are connected with the circuit, by simply closing the circuit on the press or printing magnets, as will be hereinafter explained.

Figure 1 is a side elevation of the entire apparatus taken from the right-hand side, and parallel with the axis of the type-wheel, which is shown with some of the letters upon its perimeter. Fig. 2 is a partial section and elevation made at a right angle to Fig. 1, the type-wheel and its presser being shown in dotted or broken lines, while the winding and press magnets and striking mechanism are shown in full or solid lines. Fig. 3 is a plan of the clutch that connects the reactive spring or weight with the type-revolving mechanism.

The entire mechanism is mounted upon and within the base or pedestal, as shown at A, the type-wheel B being fixed upon an axis, C, which is mounted in suitable bearings in the upright frames D D', which also support the escapement E, and its axis, F, upon one end of which, as at G, is a forked arm, which engages with the armature H, of the pole-changing magnets I, which are arranged to be always in the circuit along with the press-magnets J, when only one wire is used in the circuit, and combined with them are also the winding or power-accumulating magnets K, which are thrown into the circuit by the switch, as shown at L, Fig. 2, the tongue of said switch being attached to the armature of the press-magnet, so that when its circuit is closed the magnets K will also be cut into the circuit. But all the devices here referred to are old or well known, except the third pair of winding or accumulating magnets shown at K, Fig. 2, where one of the principal characteristics of my invention is distinctly shown or illustrated, and where the armature M is represented in contact with the magnet K. Said armature is suspended to the uprights D D' by a pivotal connection, as shown at *m*, Fig. 2, and from said armature an arm, as at N, extends to some distance in order to give considerable range of motion, and to the end of said arm a spiral spring, as at O, is attached, and the other end of said spring is suspended to some suitable portion of the frame, so that, as the arm N is drawn down by the attraction of the armature upon the magnets K, the spring's reactive force can be utilized in rotating the type-wheel or printing-disk. This is accomplished by connecting the lever N with the clutch or pawl and ratchet-wheel shown at Fig. 3, which is mounted on the axis of the master-wheel P, the teeth of which engage with the small pinion *p* upon the axis C of the type-wheel B. Said connection is made by pivoting a rod at one end to the arm N, and the other to the short arm of the clutch, as at *n*, Fig. 3, and which is there shown as arranged at a right angle to the arm that carries the pawl *q*, which engages with the ratchet-wheel R that is fastened upon the axis of the wheel P; consequently as the lever N is depressed the pawl *q* will be drawn back

to re-engage with the ratchet, and as the spring O is also extended by said depression of the lever N its reactive force will be exerted upon the ratchet to rotate the wheel P, and thereby the type-wheel B, whenever the escapement will permit said rotation. A weight and cord will answer the same purpose as the spring O, though the spring is quite effective and more convenient, as its power can be adjusted quite easily by connecting its fixed end to an adjusting-screw, and also insulating it, not here shown. The magnets K are so placed and connected as to be in the circuit when the press-magnets J are in action; consequently, whenever a character is printed the spring O is acted upon, provided the armature is not already upon the magnets K, and hence, by said additional pair of magnets, a reserve force is constantly maintained to revolve the type-wheel. The second part of my invention, consisting of the signal-bell and its striking mechanism, acting in combination or synchronism with the type-wheel, is operated by the press-magnets J, the armature of which is shown at S, and which is suspended to the frame D D' similarly to the armature M on the opposite side, and from said armature an arm, as at T, extends out and across to the opposite side of the machine to give motion to the lever U which carries the presser-wheel V to raise the paper against the type-wheel B. Near the outer end of said arm T is pivoted the stem or handle of the bell-hammer W, the bell itself being shown at X, mounted upon a column, Y, at or near the top of the uprights D D', and which support the bell above the machine. Upon one side of the hammer stem W is projected an arm, Z, at a right angle, or nearly so, to the stem itself, thereby forming a bracket upon the hammer-stem, and the outer end of said bracket is beveled like the end of a spring-bolt, and said end reaches out sufficiently far to be in close proximity to another bracket, as at Z', which is fastened upon the axis of the type-wheel B, and upon which the escapement-wheel Z<sup>2</sup> is also fastened, and the two brackets are so arranged relatively to each other that when the operator desires to strike the signal-bell he operates the escapement-magnets I until the bracket Z' is brought to the position shown at Fig. 2, and then by closing the circuit on the press-magnets J the arm T is thereby depressed, being attached to the armature S of

said magnets, which suddenly carries down the bell-hammer stem W and brings its brackets Z in contact with the bracket Z', whose end is also beveled, and when the two inclines meet each other the stem of the bell-hammer is thrown quickly back, and the knob on the end thereof is thereby caused to strike the bell, and a series of blows may be continued as long as the escapement and type-wheel remain at rest in that position, simply by opening and closing the press-circuit, and by such means the instrument may be used to indicate the hour or times at which any change of reports is to be made, as, for example, the change from gold to stocks, or between stocks of various kinds, &c. The bell-knob is quickly withdrawn from the bell by a spring, as at Z<sup>3</sup>, one end of which is attached to the stem W, and the other to the frame D, and the lever T is also raised by a spiral spring, as seen at Z<sup>4</sup>.

The magnets are, of course, connected in the circuit in the usual manner by the studs and screws, shown at 1 and 2; and it is evident that various modifications of the mechanism may be devised without departing from the nature of my invention; therefore

I claim—

1. In a printing-telegraph, as described, the use of an independent pair of magnets in the same circuit with the press-magnets, or in a separate circuit, if desired, for supplying the power to revolve the type-wheel, as described, and for the purposes set forth.
2. The combination of the magnets K, armature M, lever N, spring O or its equivalent, and clutch on the axis of the master-wheel P, to rotate the type-wheel, as described, and for the purposes set forth.
3. In combination with the type-wheel of a printing-telegraph, as described, the signal-bell and its striking mechanism when operated by the press-magnets, as described, and for the purposes set forth.
4. The combination of the arm T with the armature S of the press-magnets J, the bell-hammer W with its bracket Z, and the bracket Z', all combined and arranged substantially as described, and for the purposes set forth.

ADOLPHUS A. KNUDSON.

Witnesses:

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BOYD ELIOT.