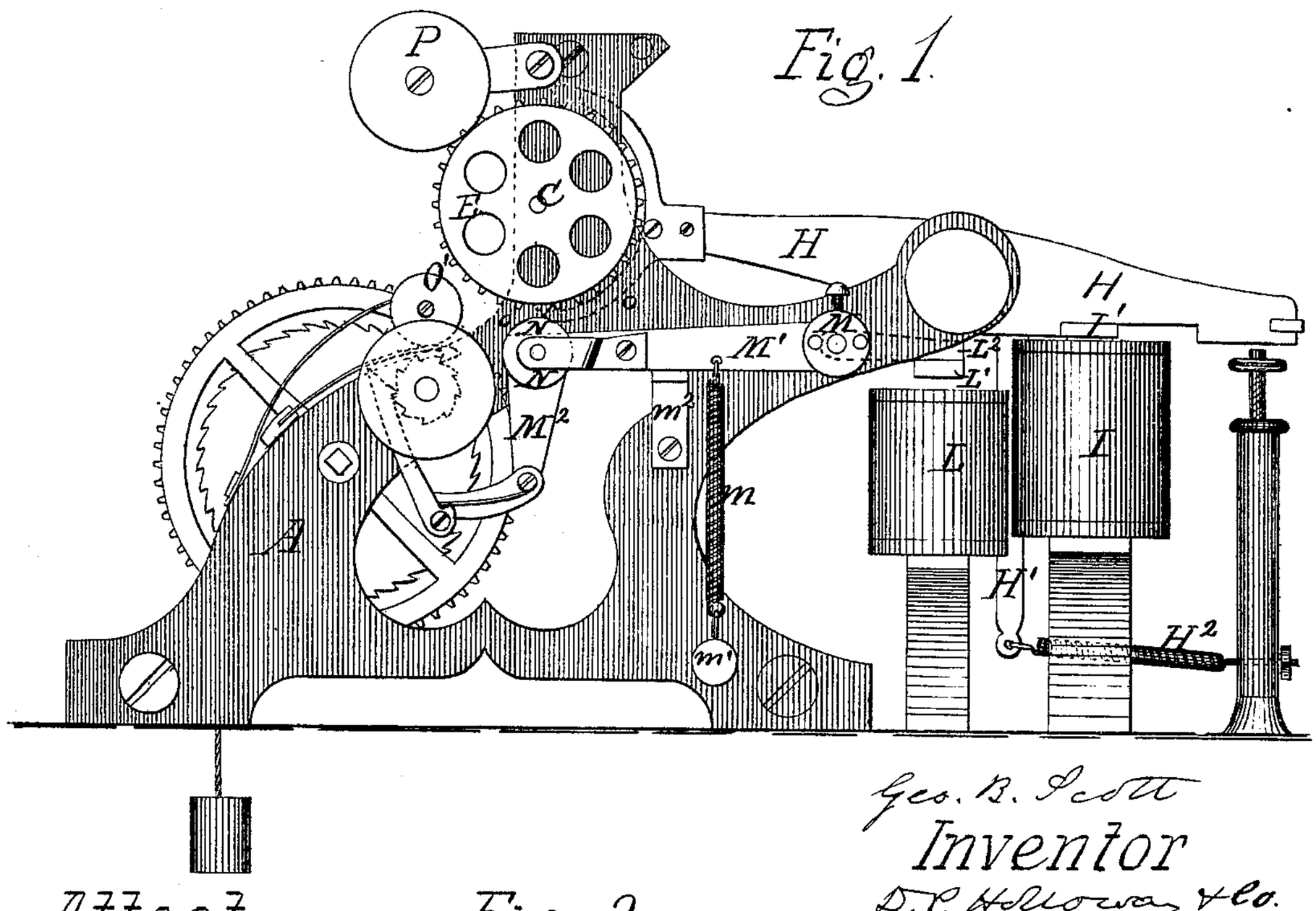
2 Sheets--Sheet 1.

GEORGE B. SCOTT.

Improvement in Printing-Telegraphs.

No. 126,336. Patented April 30, 1872.

Fig. 1



Geo. B. Scott
Inventor

Attest
C. F. Clausen

Fig. 2

D. P. Holloway & Co.
Attys

2 Sheets--Sheet 2.

GEORGE B. SCOTT.

Improvement in Printing-Telegraphs.

No. 126,336. Patented April 30, 1872.

Fig. 3

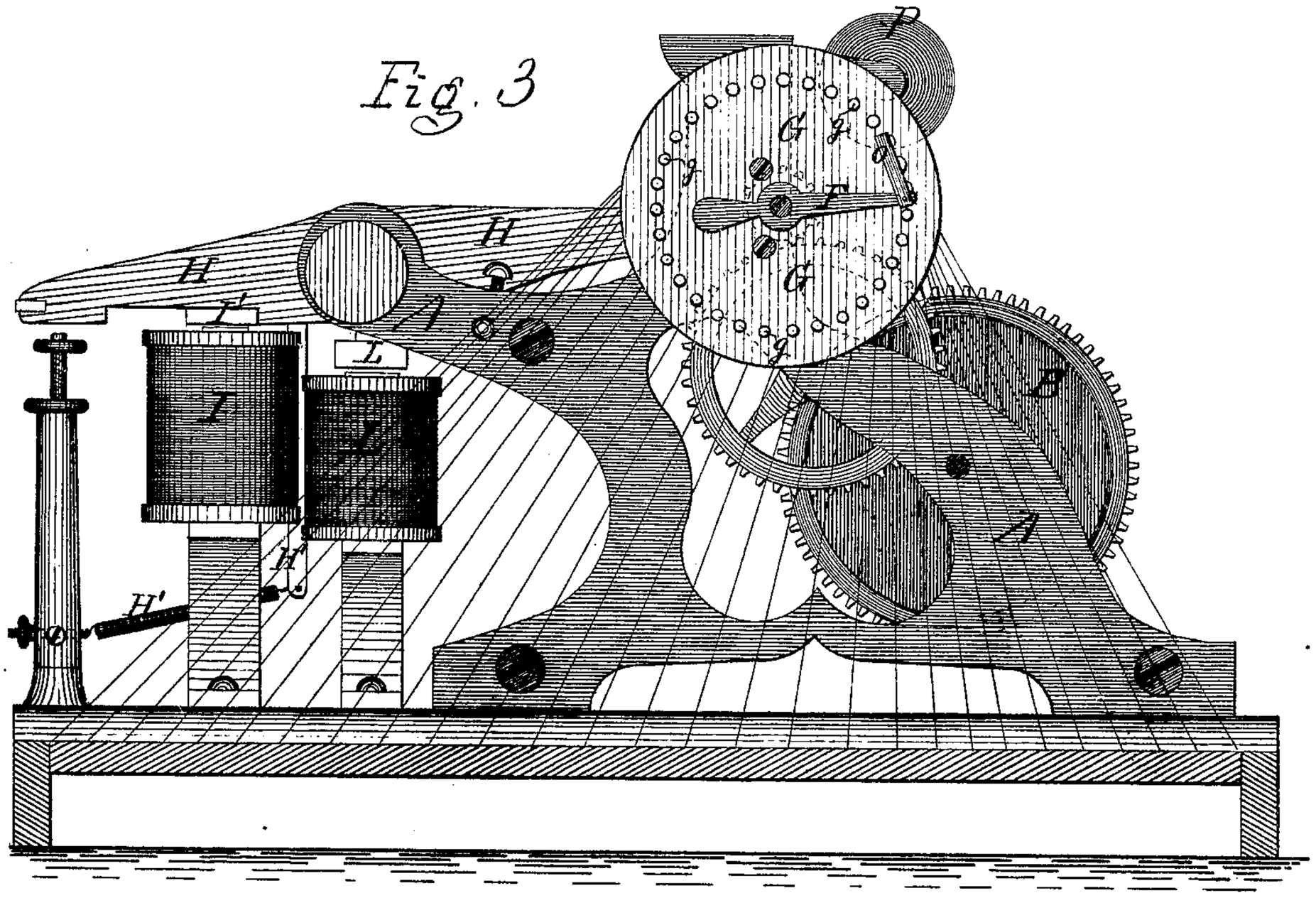
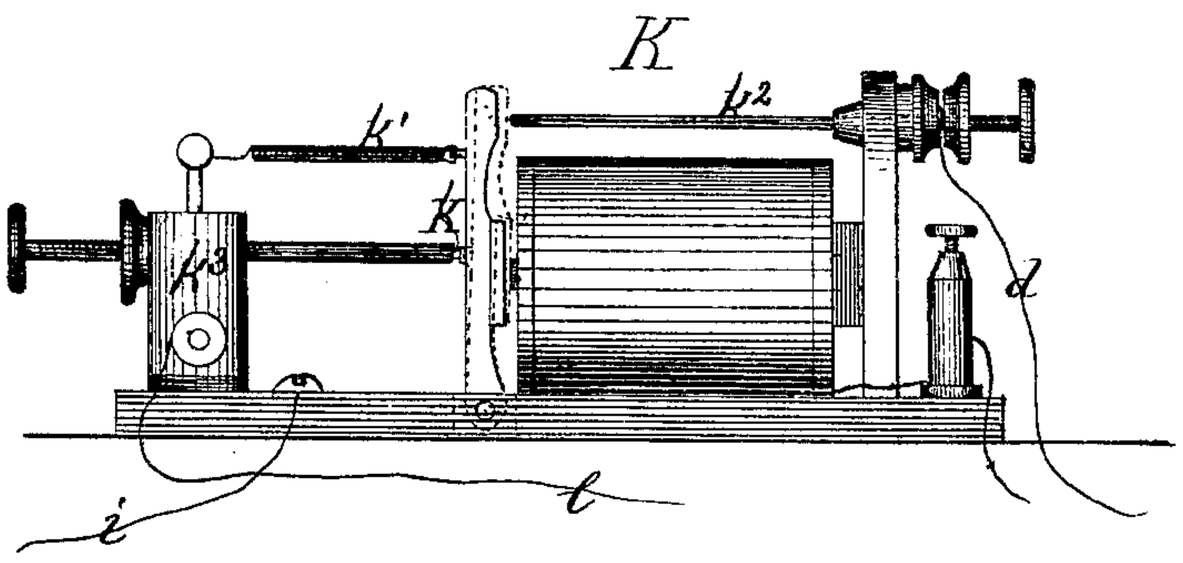


Fig. 4



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E. Edwd. Eib
C. F. Clausen.

Geo. B. Scott
Inventor
D. P. Holloway & Co
Attys

126,336

UNITED STATES PATENT OFFICE.

GEORGE B. SCOTT, OF BROOKLYN, NEW YORK, ASSIGNOR TO HIMSELF AND A. G. DAVIS, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN PRINTING-TELEGRAPHS.

Specification forming part of Letters Patent No. 126,336, dated April 30, 1872.

Specification describing certain Improvements in Printing-Telegraph Machines, invented by GEORGE B. SCOTT, of Brooklyn, in the county of Kings and State of New York.

This invention relates to that type of electro-magnetic telegraph-machines which both transmit and record a message in the locality in which the machine is placed, and operate a machine to record such message in any distant locality; and it consists, first, in the use of a current-wheel, the projecting pins or points of which are all connected with the operating keys in such a manner that all of such keys are in a closed circuit except the one which, for the time being, is depressed, such depression operating to break the circuit of the line, and thus render it certain that the machine at the opposite end of said line will only be operated in unison with the one through which the message is being transmitted.

The register of this improved machine embodies in its construction an escapement-magnet, which controls the movements of the type-wheel; a circuit disk and automatic circuit-breaker, which, when the main circuit is thrown on the line in rapid succession and without interruption, opens and closes the main circuit and causes a constant intermittent rotation of the type-wheel; and a printing-magnet, which operates to take an impression upon a strip of paper from the type-wheel at each cessation of its rotation caused by a break in the main circuit as the circuit-breaker comes in contact with a pin on the circuit-disk, the corresponding key of which on the claviary is depressed; and my improvement consists, secondly, in such a combination of the above-named elements with the relay that, although the local circuit which takes in the printing-magnet is closed at each back-stroke of the relay, this local current will be so momentary as to fail to attract the armature of the printing-magnet, which attraction will take place only when the main circuit is broken by the depression of the keys on the claviary.

Figure 1 is a front elevation. Fig. 2 is a plan view. Fig. 3 is a rear elevation. Fig. 4 is a view of the relay detached.

The same letters of reference are employed in all the figures in the designation of identical parts.

The registering mechanism is mounted in housings A A, and is set in motion by a weight suspended on a cord which is fastened to the drum B. The latter is connected by intermediate gear-wheels, and gives motion to the shaft C, which carries the escapement-wheel D, type-wheel E, and circuit-breaker F, all made fast to it. The circuit-breaker rotates over the outer face of the insulated circuit-disk G, constructed with projecting metallic pins *g g*, each of which is connected, by a wire, *g'*, to its respective key on the claviary, as clearly shown in Fig. 2. The number of pins on the stationary circuit-disk, and of teeth on the escapement-wheel, is equal to the number of keys on the claviary and of characters on the type-wheel. The escapement-wheel is controlled by the pallets on the end of the lever H, which oscillates on the axis *h* and carries the armature I' of the escapement-magnet I. The oscillations of the escapement lever H are checked by adjustable stops in the usual manner, and the lever is constructed with an arm, H^1, attached to an adjustable spring, H^2, by which the lever is turned to carry the armature I' away from its magnet the moment the current ceases. K represents the relay, which is of ordinary construction, except that the point of rest *k*, against which the armature-lever is drawn by the spring k^1 when the current through the magnet is interrupted, is made of metal. The insulated rod k^2, with which the armature-lever of the relay comes in contact when the armature is attracted by the magnet, is connected by the wire *d* to the escapement-magnet I, which is in turn connected by the wire *e* with one pole of the local battery, the other pole of this battery being brought into metallic connection with the axis of the armature-lever by means of the wire *i* and frame of the relay. The armature L^1 of the printing-magnet L of the register is secured to an arm, L^2, of a shaft, M, which projects at one end through its bearing in the housing A, and carries on this overhung end the arm M'. The latter is acted upon by a comparatively-stiff spring, *m*, the tension of which is regulated by the screw m^1 to carry

the arm down to the stop m^2 when the current leaves the printing-magnet. Near its outer end this arm is provided with a roller, N, the axis of which is vertically under the axis of the type-wheel, with which it is brought into contact when the armature of the printing-magnet is attracted. The strip of paper upon which the impressions are to be made is passed from a suitable reel through guides *n n*, over the roller N, between the serrated wheel O, and counter-roller O′. After each impression, and on the descent of the arm M′, the strip of paper is drawn forward the proper distance by the serrated wheel O, which is for this purpose rotated by means of a pawl carried on the bent portion M^2 of the arm M^1, which pawl engages the teeth of a ratchet-wheel fast on the axis of the serrated wheel O. The type-wheel is inked by the inking-roller P. The printing-magnet is connected by the wire *f* to the screw-cup 1, and thence through the wire *e* with the local battery, and also through the wire *l* with the insulated standard k^3 of the relay, in which standard the stop-rod *k* is mounted. The arrangement of the circuit-breaker F in relation to the escapement is such that when the armature I′ is away from the magnet I, the finger *o* of the circuit-breaker will be in contact with some one of the metallic pins *g* on the circuit-disk G; but the moment this armature is attracted—which will release the escapement-wheel from the upper pallet of the lever H, so as to permit it to advance the distance of one-half of a tooth—the finger of the circuit-breaker will be turned between two pins, *g*, without coming in contact with either. The keys of the claviary are kept in contact with the bar R when at rest. When the main current is thrown on the line at the distant office it enters, from wire *c*, the coils of the relay-magnet; thence goes through the wire *b* to the frame of the register, circuit-breaker F *o*, the pin with which the latter is in contact, through one of the wires *g′* to a key and rod. R, and by wire *a* to battery and ground. The relay-magnet attracts its armature, which establishes the local circuit through the escapement-magnet I, bringing the escapement-lever down, which causes the advance of the escapement-wheel, whereby the finger of the circuit-breaker is turned between two of the pins on the circuit-disk and the main circuit broken. The moment this takes place the armature of the relay flies away from its magnet, interrupting the local circuit through the escapement-magnet I. The lever H is thrown up by the spring H^2, and the escapement-wheel and circuit-breaker advance another step, so as to bring the finger of the latter in contact with the next pin on the circuit-disk, whereby the main circuit is again closed, causing another attraction of the escapement-magnet by means of the local battery and relay. In this manner a constant intermittent rotation of the type-wheel will be effected and maintained so long as the main current is on the line and all the keys of the claviary in contact with the bar R.

It will be understood that at each back stroke of the relay-magnet armature a local circuit is established through the printing-magnet L; but this current is too momentary, and the spring *m*, acting on the lever of the armature L^2, too stiff to permit an attraction of the latter sufficient to throw up the arm M′. But on the circuit-breaker coming in contact with a pin on the circuit-disk, the corresponding key of which on the claviary is depressed—in consequence of which the main circuit is broken so that the relay armature is not attracted by the magnet—the local circuit through the printing-magnet causes an attraction of the armature L^1, throwing the roller N up to take an impression of the letter presented to it by the type-wheel upon the interposed strip of paper, this letter corresponding with the letter on the depressed key of the claviary. Again releasing this key brings it in contact with the bar R, again establishing the main circuit and the consequent intermittent rotation of the type-wheel until the circuit-breaker strikes another pin, the key of which is depressed, when another letter is printed.

The above-described arrangement of circuits is equally applicable to other printing and dial telegraphs; and I wish it, therefore, to be understood that I do not limit myself to its use in connection with this particular instrument.

I am aware that telegraph-machines have heretofore been made which have employed an insulated disk or a circuit-wheel, and which has had its keys all connected with projections upon said wheel by separate wires; but in all such cases, as far as I am aware, one-half of such keys have worked in an open, and the remaining half in a closed circuit, thus making it necessary that the circuit-closer should rest upon two of the projections upon the circuit-wheel at one and the same time, which arrangement has resulted in the printing of a letter on both the down and up stroke of the armature, such arrangement rendering the registering-machine liable to miss or skip some of the letters, owing to the great rapidity with which it has had to work.

Mine differs from all such machines in that only one letter is printed upon both a downward and upward movement of the armature; and, owing to the further fact that the current is broken during the passage of the circuit-closer from one of the projecting pins to another, thus rendering it impossible that the registering-machine shall fail to work in unison with the transmitting one, and thus register all the letters transmitted.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the relay K, insulated circuit-disk G *g* connected by wires *g′* to the keys of the key-board—the disk and keys being in same closed circuit—circuit-breaker F *o*, escapement-wheel D actuated by a weight or its equivalent, escapement-lever H I′, and

escapement-magnet I, all arranged in relation to the main and local circuits, substantially as specified.

2. The combination of a circuit-wheel and bank of keys, which are all in a closed circuit except the one which is for the moment depressed, the arrangement of said keys and the wires which connect them with the circuit-wheel being substantially such as described, whereby the circuit is broken when the circuit-breaker is midway between the projecting points or pins of the circuit-wheel, for the purpose set set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE B. SCOTT.

Witnesses:

E. F. LUDWIG,

D. J. LUDWIG.