(No Model.)

4 Sheets—Sheet 1.

R. J. SHEEHY.

PRINTING TELEGRAPH.

No. 506,273. Patented Oct. 10, 1893.

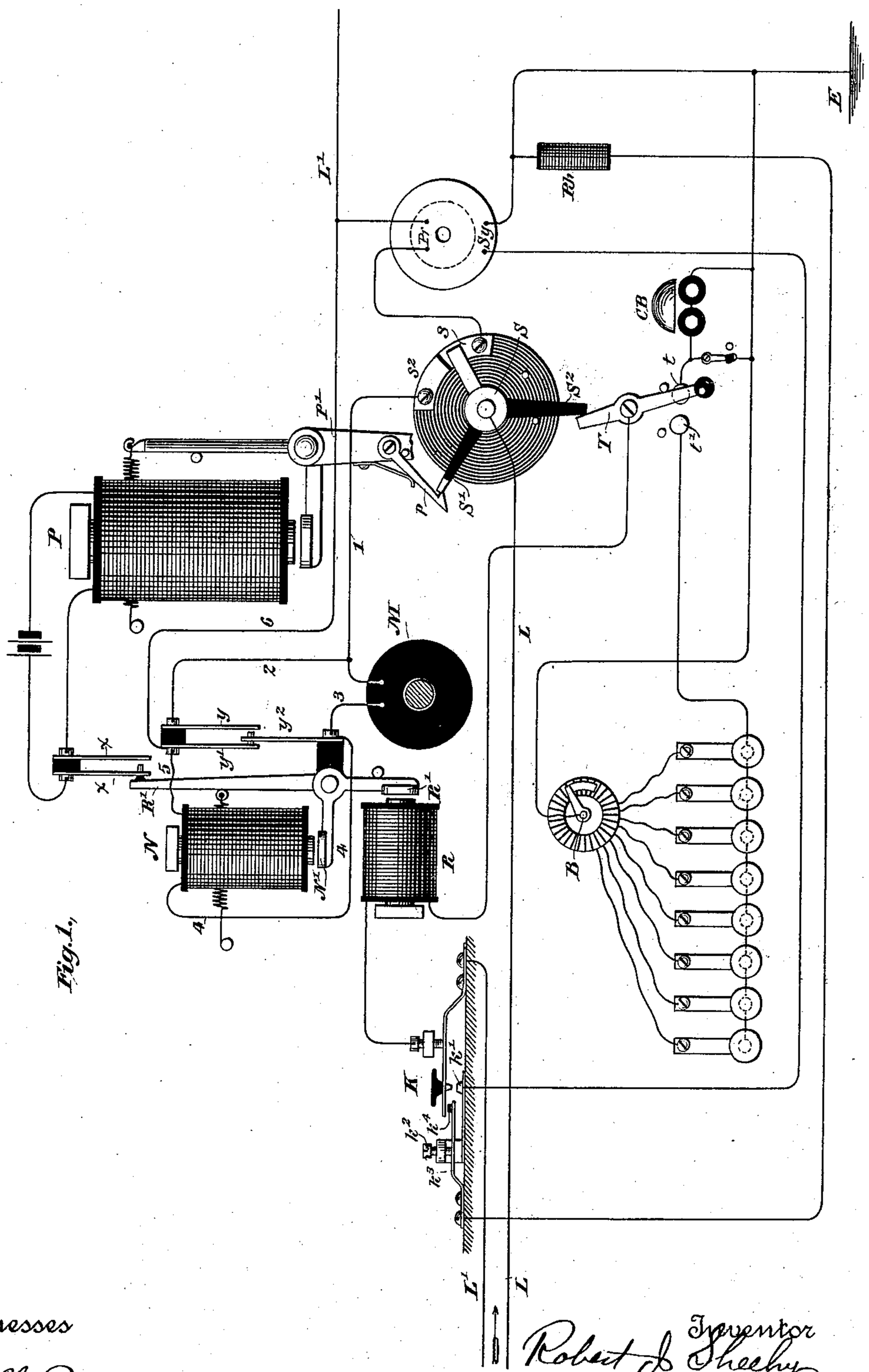

Fig. 1.

Witnesses
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Henry W. Lloyd.

Inventor
Robert J. Sheehy
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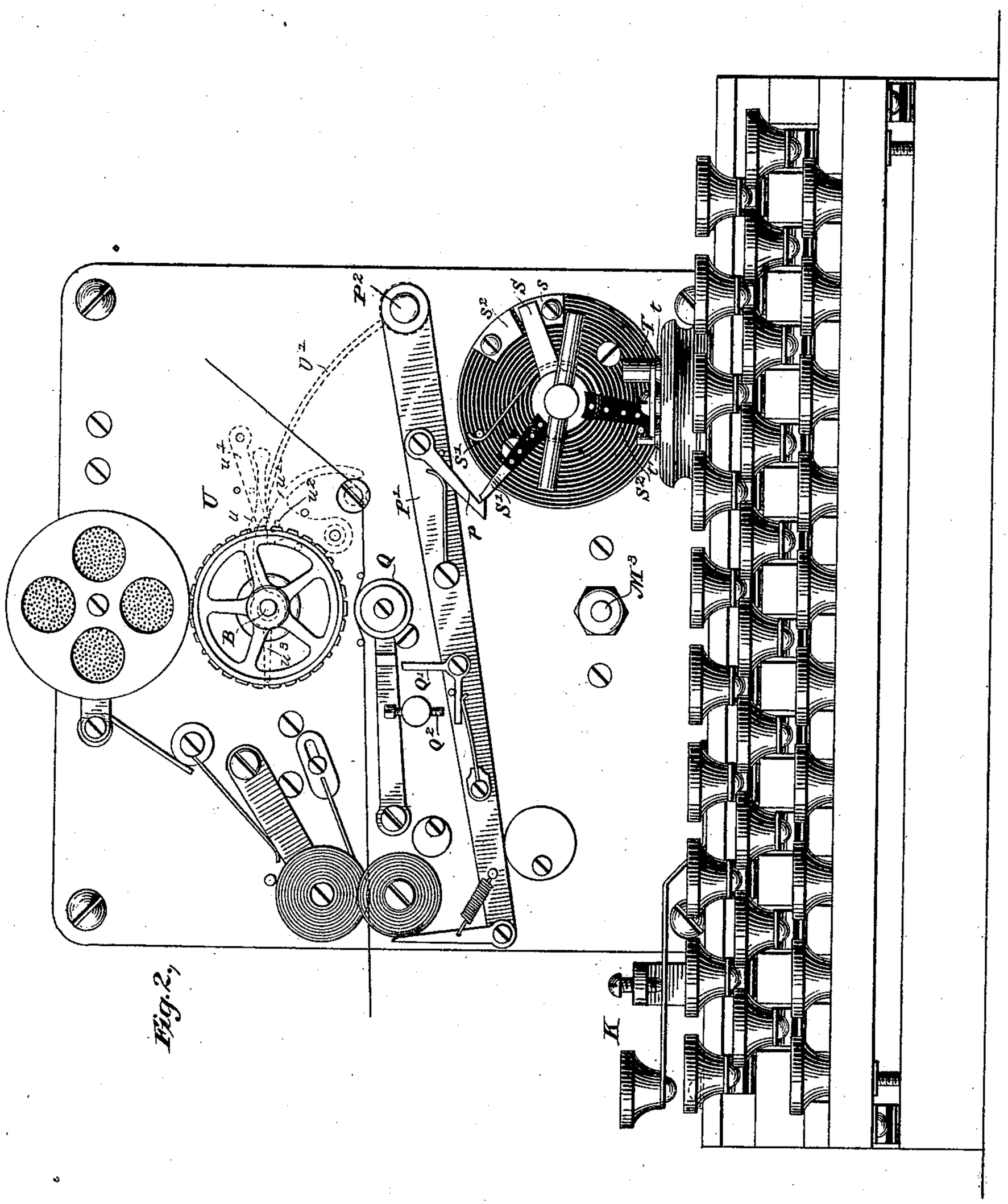

Fig. 2.

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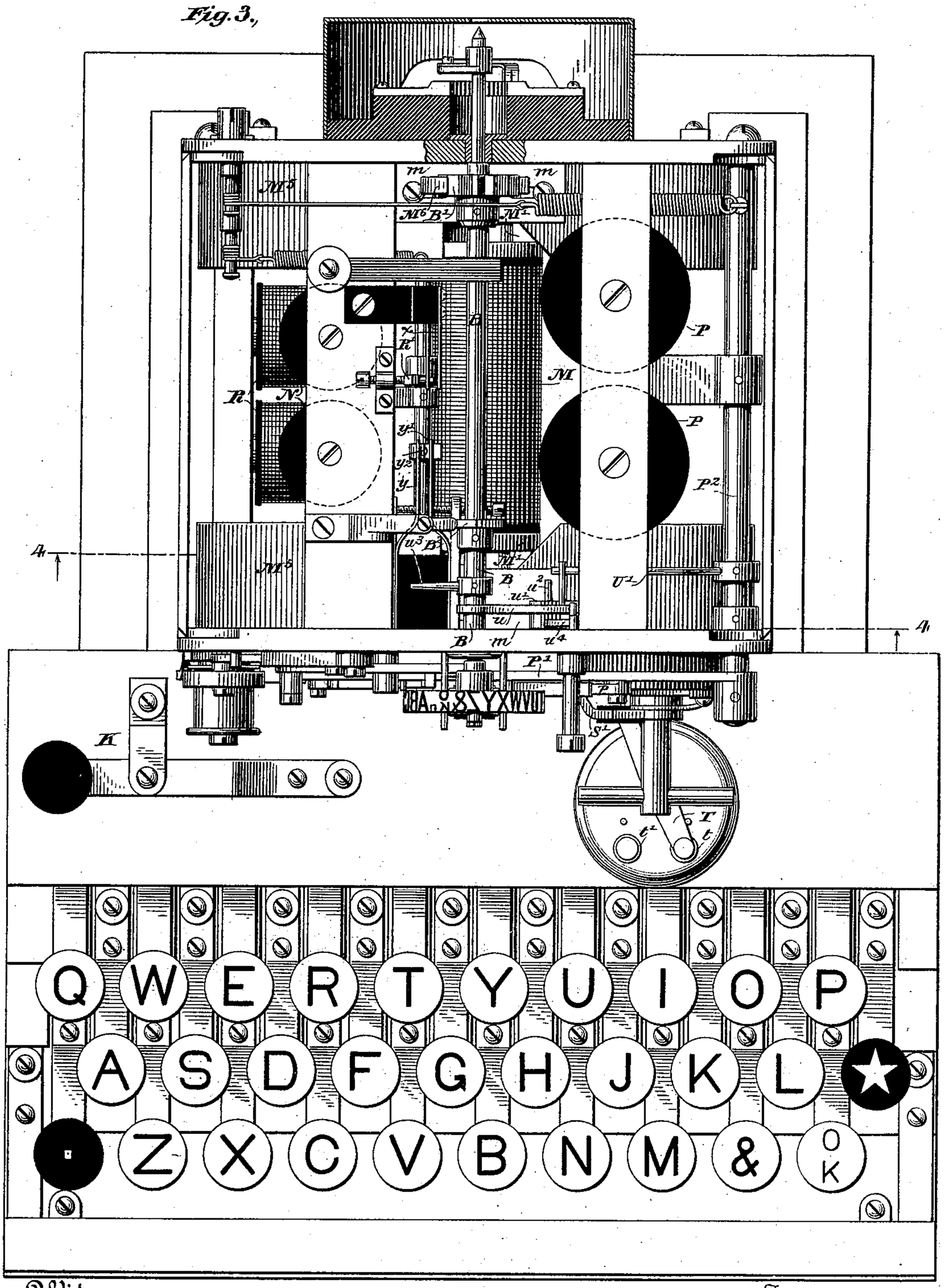
Fig. 3.



Witnesses
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(No Model.)

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R. J. SHEEHY.

PRINTING TELEGRAPH.

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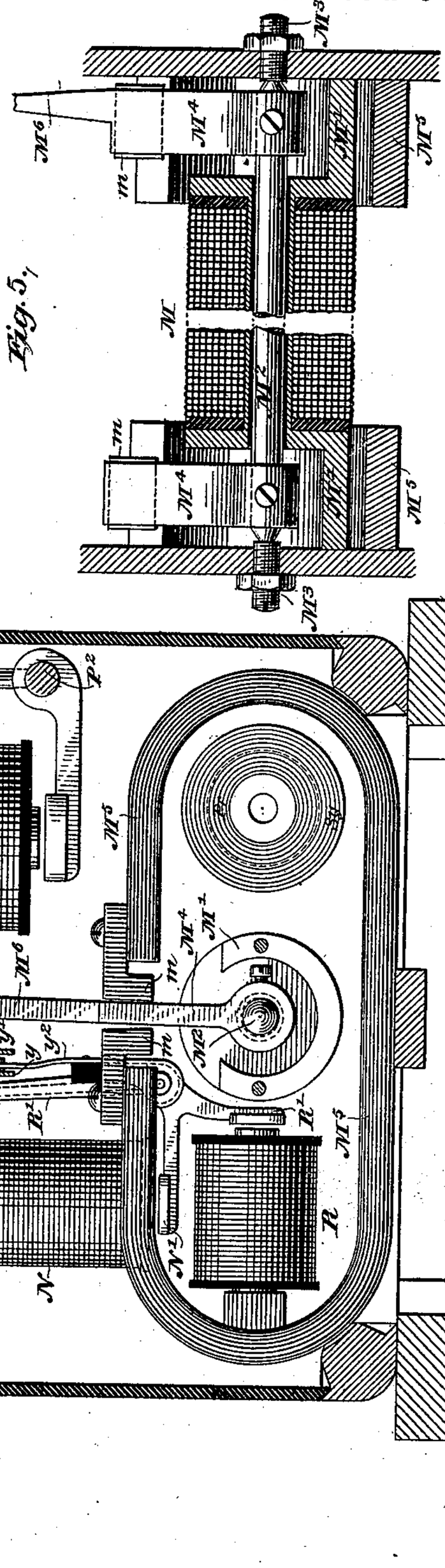

Fig. 5.

Fig. 4.

Witnesses
Geo. W. Breck.
Henry W. Lloyd.

Robert J. Sheehy Inventor
By his Attorneys
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UNITED STATES PATENT OFFICE.

ROBERT J. SHEEHY, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO WENDELL GOODWIN, OF SAME PLACE.

PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 506,273, dated October 10, 1893.

Application filed October 31, 1890. Renewed March 15, 1893. Serial No. 466,173. (No model.)

To all whom it may concern:

Be it known that I, ROBERT J. SHEEHY, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Printing-Telegraphs, (Case A,) of which the following is a specification.

My invention relates to that class of printing telegraphs in which the instruments are driven synchronously by currents transmitted over a synchronizing or controlling line, and messages are transmitted over an operating or message line. Such a system may be a printing telegraph exchange system and for such a system my invention is specially adapted. In the instrument herein described I provide an organization by which the resistance of the synchronizing line is maintained practically constant and at the same time provides a means for calling up the central office. To this end I employ an induction coil through the primary of which the synchronizing line extends when the instrument is not in use. The secondary of this coil is normally closed upon itself and may include a suitable resistance. The primary is designed to be of the same resistance as the motor coil through which the controlling or synchronizing line extends when the instrument is in operation. The secondary circuit is connected to earth at one point and by the manipulation of a key the secondary current may be sent over the telegraphing line to call the central office. The instruments are driven by an armature lever having a pallet or anchor engaging a star wheel on the type wheel shaft, the armature being vibrated by alternating currents passing in the motor or actuating coil. The organization is further such that upon the reception of a printing or message impulse of current a switch is released to automatically transfer the synchronizing or controlling circuit from the primary of the inductorium through the motor or type wheel actuating coil, and the instrument immediately commences to rotate.

My invention is comprised in the general organization above outlined, as well as the details of construction and special organization hereinafter set forth.

In the accompanying drawings; Figure 1 is a diagram view illustrating the general arrangement and operation of the system; Fig. 2 a front view of the instrument; Fig. 3 a plan view; Fig. 4 a transverse section on the line 4, 4, of Fig. 3; Fig. 5 a detail sectional view of the motor devices.

The general organization will be described first, more especially with reference to the diagram Fig. 1.

The synchronizing line L runs to the arm of a pivoted switch S bearing, when the instrument is not in operation, upon an insulated contact *s*, connected with the primary P*r*, of an induction coil, the other terminal of which is connected to the outgoing line L′. The pivoted switch has two other insulated arms S′, S², the former of which is engaged by a spring catch *p*, on the press lever P′. The switch is therefore normally held in the position shown against the tension of its spring *s′* which tends to transfer it to the contact *s²*. With the switch in the position shown the arm S² operates to throw the switch T over upon its contact *t* which is connected with the earth at E. The telegraphing line L′ is connected with this switch and is, therefore, normally grounded. It extends from the switch through the coil of a relay R to the upper stop of a key K to which the main line L′ is connected. The secondary S*y* of the inductorium may include a suitable resistance R*h*. Its metallic circuit is grounded at E, and is normally closed through the bottom stop *k′* of key K, the stop *k²* connected therewith, and spring contact *k³* normally bearing against the stop *k²*. If alternating impulses are traversing the line, and primary of the induction coil, on depressing the key K it bears against a piece of insulating material *k⁴* on the finger *k³* and opens the secondary circuit at *k²*. The secondary circuit is then from earth at E, through the secondary coil to the stop *k′* and key K to line L′. This sends a calling current to the central office or distant instrument which may operate a call bell C B that may be placed in the line L′ between the switch T and earth.

A message impulse passing through the coils of the relay R to earth at E vitalizes that relay and effects the following operation: Its armature R′ being attracted, the armature lever closes the local circuit of the press magnet P at the contacts *x x*. The press

magnet attracts its armature and the press lever P′ is thrown up, releasing the arm S′ of the switch S which is immediately thrown by its spring over to the contact s^2. The synchronizing circuit is therefore transferred from the primary of the inductorium through the coil M of the motor magnet, the contact s^2 being connected by a wire 1 with one terminal of the coil M. The same terminal of the coil is connected by wire 2 with an insulated contact finger y, and the opposite terminal is connected by wire 3 with a contact finger y^2 mounted upon and insulated from the armature lever R′, and vibrating between the contact finger y and a similar insulated contact finger y'. The finger y^2 is connected by wire 4 with one terminal of the coil of a magnet N whose armature N′ is mounted upon a right angular extension of the armature lever R′. The opposite terminal of the coil N is connected by wire 5 with the contact finger y' and also by wire 6 with the outgoing synchronizing line L′. Alternating impulses traversing the coil M produce the step by step rotation of the type wheel shaft B in a manner hereinafter described. When the switch S is on the contact s^2 and the magnet R is vitalized by a message current, the press magnet lever effects an impression from the type wheel. At the same time the contact arm y^2 is transferred from the contact y' to the contact y. The motor coil M is therefore shunted through the conductor 2 contacts y, y^2, and the circuit is through wire 4 and coils of magnet N to line by wires 5 and 6. The magnet N, attracts its armature, supplementing the action of the magnet R, and the condition described is maintained as long as either the printing impulse or the impulse in the synchronizing line lasts. If, at the moment the printing impulse ceased to be effective in the coils of the magnet R, an impulse of either polarity from the synchronizing line was traversing the coils of magnet N, that impulse would cause magnet N to still attract its armature and maintain the condition already described, *i. e.*, the motor coil would be still shunted. But on the cessation of said impulse in the coils of magnet N, there then being no current in the coils of magnet R, the armatures of N and R would fall back, the print circuit would be opened, and the shunt around the motor coil broken, and the current from the synchronizing line again traversing the motor coil, its armature would be vibrated and drive the type-wheel shaft. Were it not for this arrangement the transmitting and receiving instruments might not start exactly together. If the throwing of the motor coil into circuit depended entirely upon the magnet R, it might occur at a time when only a fraction of the impulse at the time traversing the synchronizing line would pass through the motor coil and a false movement of its vibrating armature might occur at one of the instruments; whereas with the arrangement described the motors always start when a complete impulse from the synchronizing line traverses their coils. When the armature lever R′ falls back upon the demagnetizing of the magnets N and R the circuit through the motor magnet M is restored, it being as follows: From the contact s^2 through the coil of the magnet and by contacts y^2 and y', which are normally in contact, and thence by wire 6 to the line, the magnet N now being shunted. The source of current for transmission of messages may be located at the central office. When the operator desires to transmit, the switch T is put over to the contact t'. The transmitting circuit is then from earth at E, through the trailer of the sunflower, on the type wheel shaft B, the respective segments thereof, keys and key contacts, to the switch point t', switch T and thence through the magnet R, and key K to line L′. Both the sending and receiving instruments are therefore operated, as is well understood, to print the desired characters selected by the depression of the transmitting keys. It is contemplated that the resistance of the primary of the induction coil shall equal, or approximately equal that of the coil M, and that the coil N shall equal or approximately equal that of the coil M. A condition of practically uniform resistance is, therefore maintained in the synchronizing line. The use of a secondary current for calling is desirable because the transmitting battery at the central station need not be always connected with the operating line, and no calling battery need be located at each instrument. At the same time the current on the synchronizing line must at all times be sufficient for the motor, and when the instrument is not in use may without loss be directed through the primary of the inductorium.

The general organization and operation being understood, the construction of different parts of the instrument will be described. Such parts as are not particularly described may be assumed to be of ordinary and well known construction.

The coil M is mounted upon a brass bobbin M′ having a projection at each end by which it is secured to the front and back plates of the instrument. Within the coil is loosely arranged a soft iron core M^2, pivoted in bearing M^3 in the front and back plates. On each end of the core is fixed an iron arm M^4 projecting upwardly between the opposite poles of permanent magnets M^5 that may be curved as shown in Fig. 4 and provided with pole pieces *m*. The arms M^4 are alternately polarized by the reverse currents traversing the coil M, and are consequently driven back and forth between the pole pieces *m* of the permanent magnets. One of the arms M^4 carries an extension M^6 having at its end an anchor or pallet that engages the teeth of and drives a star wheel B′ fast on the type wheel shaft B, a stop B^2 engaging a ratchet wheel on the same shaft, serving to prevent back motion. The general arrangement of

the machine is seen in Fig. 3. The sunflower being mounted in a suitable casing at the back of the instruments and the keyboard at the front. The parts corresponding with those described in the diagram are similarly lettered and more specific description is unnecessary. The armature of the press magnet is connected with the rock shaft P^2 pivoted in the frame of the instrument and carrying at its front end the press lever P'. The end of the press lever carries a hooked arm which actuates the paper feed devices as usual. The platen roller Q is carried upon a pivoted arm and is thrown upwardly to take an impression from the type wheel by a pivoted pawl or finger Q' mounted upon the press lever. This finger engages a laterally projecting stud on the platen arm and is tripped at the proper moment by a tripping post Q^2 acting upon an angular extension of the pawl Q'.

Any suitable unison device may be employed in this instrument, that shown at U, Figs. 3 and 2 is the same as shown in sundry Letters Patent already granted to me. An arm *u*, mounted on an eccentric on the type wheel shaft gradually advances a curved toothed sector plate *u'* step by step until a stop u^2 thereon intercepts a pin u^3 on the type wheel shaft. An arm U' carried by the rock shaft P^2 throws up the arm *u* when an impression is taken from the type wheel and the sector plate falls back by gravity or the action of a spring. A detent u^4 that prevents the falling back of the sector plate is also thrown up by the arm U'.

I claim as my invention—

1. The combination of the synchronizing line, the independent message line, the type wheel operating devices, the motor normally out of the synchronizing line, a magnet in the message line energized by impulses received over said line, and automatic switch devices actuated upon the energizing of said magnet to transfer the synchronizing circuit through the motor.

2. The combination of the synchronizing line, a resistance through which the line is normally completed at each instrument, the motor coil of approximately equal resistance, the telegraphing line and switch devices for transferring the synchronizing circuit through the motor coil, and cutting out the resistance.

3. The combination of the synchronizing line, the switch S and primary of an induction coil through which the synchronizing line normally passes, the telegraphing line, a magnet or relay R therein, the press magnet, whose local circuit is completed upon the energizing of the magnet R, the motor coil for actuating the type-wheel shaft, and a detent on the press lever from which said switch is released on the actuation of the press lever to automatically transfer the synchronizing circuit from the primary of the induction coil through the motor coil.

4. The combination of the telegraphing line, a magnet R and a switch T included therein, the synchronizing line, a switch S, having the arms S', S^2, included therein, the press lever, and the catch thereon engaging the arm S' substantially as and for the purpose set forth.

5. The combination of the synchronizing line, a switch (S) and primary of the inductorium included therein the secondary circuit of the inductorium, the telegraphing line, and means for including the secondary circuit in said line.

6. The combination of the synchronizing line, the primary of an inductorium normally included therein, the secondary coil of the inductorium whose circuit is normally closed upon itself and connected to earth on one side of the coil, the telegraphing line, and means for connecting the secondary on the other side of said coil, for the purpose set forth.

7. In a printing telegraph, the combination, of a type-wheel and its shaft, type wheel shaft actuating devices, a synchronizing line over which impulses of current are received to operate said devices, a telegraphing line, an electro magnet therein, means for throwing the type-wheel actuating devices out of action when said magnet is vitalized, a second magnet also operating to throw the type-wheel shaft actuating devices out of action, and circuit connections and contact devices, by which when the first of said magnets is vitalized the second is included in the synchronizing line.

8. The combination, in a printing telegraph, of a type wheel and its shaft, type wheel actuating devices, a synchronizing line over which impulses of current are received to actuate said devices, a telegraphing line, a magnet (R) included therein, its armature lever, a second magnet (N) acting upon said armature lever, and contacts and circuit connections whereby when the first magnet is vitalized the type wheel actuating devices are eliminated from the second magnet included in the synchronizing line.

9. The combination, in a printing telegraph, of a type wheel, a motor coil, a synchronizing line passing through said coil over which impulses of current for actuating the type wheel are sent, a telegraphing line, an electro magnet coil included therein, a second electro magnet coil of substantially the same resistance as the motor coil, and contacts and circuit connections controlled by both of said coils, whereby when the former is vitalized the motor coil is eliminated from the synchronizing line and the latter included therein.

In testimony whereof I have hereunto subscribed my name.

ROBERT J. SHEEHY.

Witnesses:

FRANK S. OBER,

EDWARD C. DAVIDSON.