

(No Model.)

3 Sheets—Sheet 1.

J. F. McLAUGHLIN.
ELECTRICAL TYPE WRITER.

No. 388,141.

Patented Aug. 21, 1888.

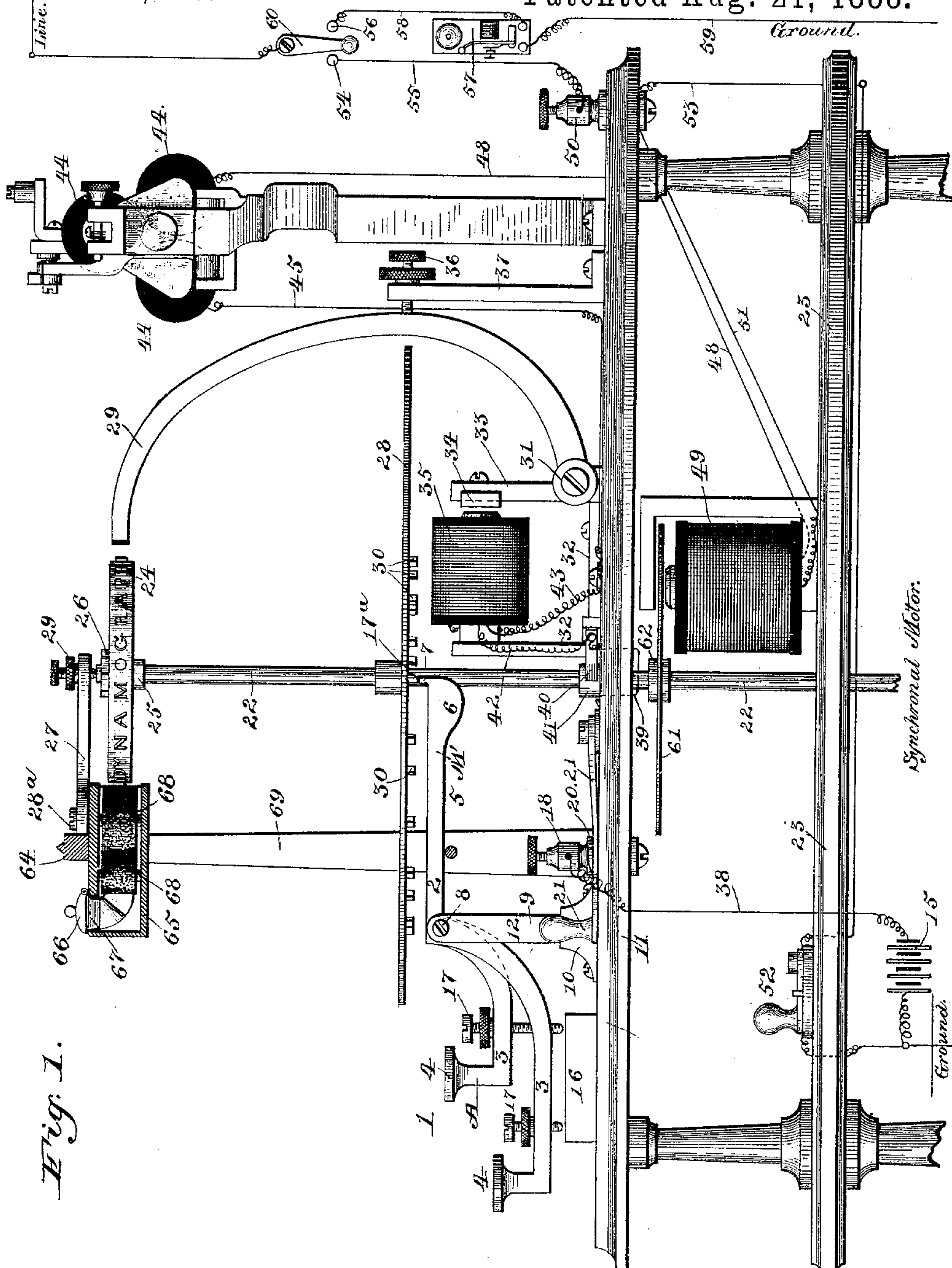


Fig. 1.

ATTEST:

Percy C. Bowen,
Carl R. Waller.

INVENTOR:

James F. McLaughlin,
By Harding Tichenor,
his Attorneys.

(No Model.)

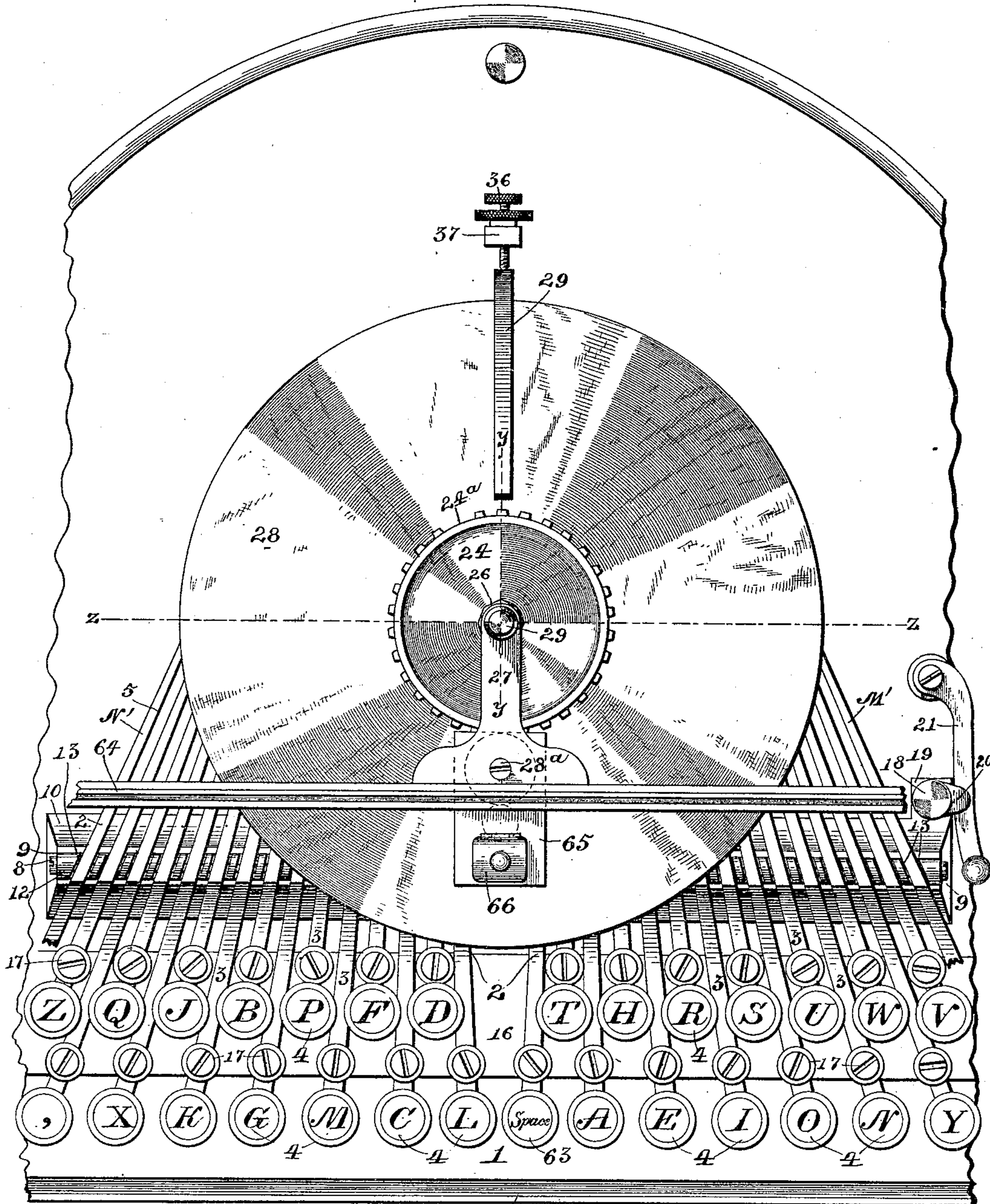
3 Sheets—Sheet 2.

J. F. McLAUGHLIN.
ELECTRICAL TYPE WRITER.

No. 388,141.

Patented Aug. 21, 1888.

Fig. 2.



ATTEST:

Percy C. Bowen.
Car B. Walker.

INVENTOR:

James F. McLaughlin.
By Harding Fitchner.
his Attorneys

(No Model.)

3 Sheets—Sheet 3.

J. F. McLAUGHLIN.
ELECTRICAL TYPE WRITER.

No. 388,141.

Patented Aug. 21, 1888.

Fig. 3.

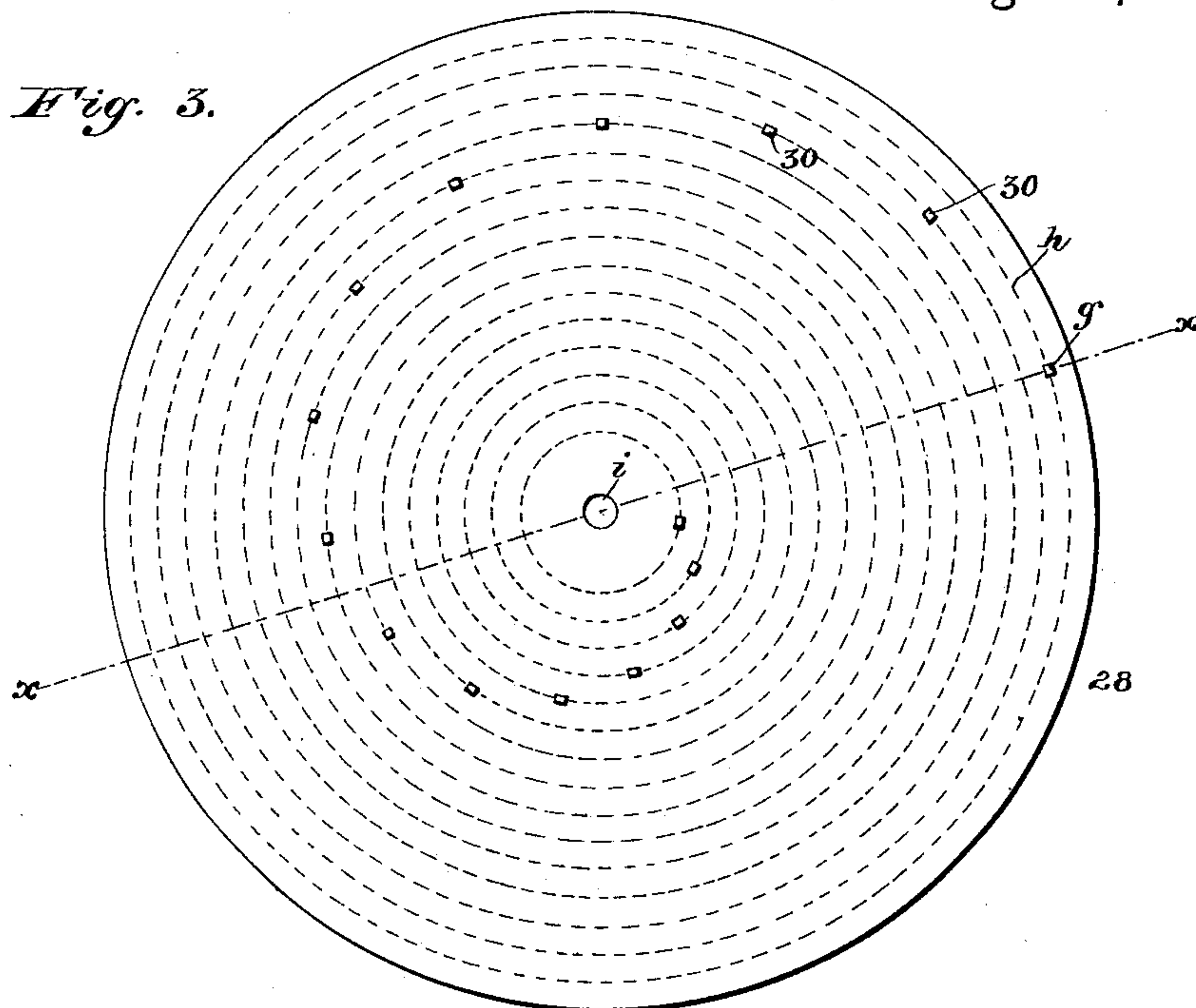
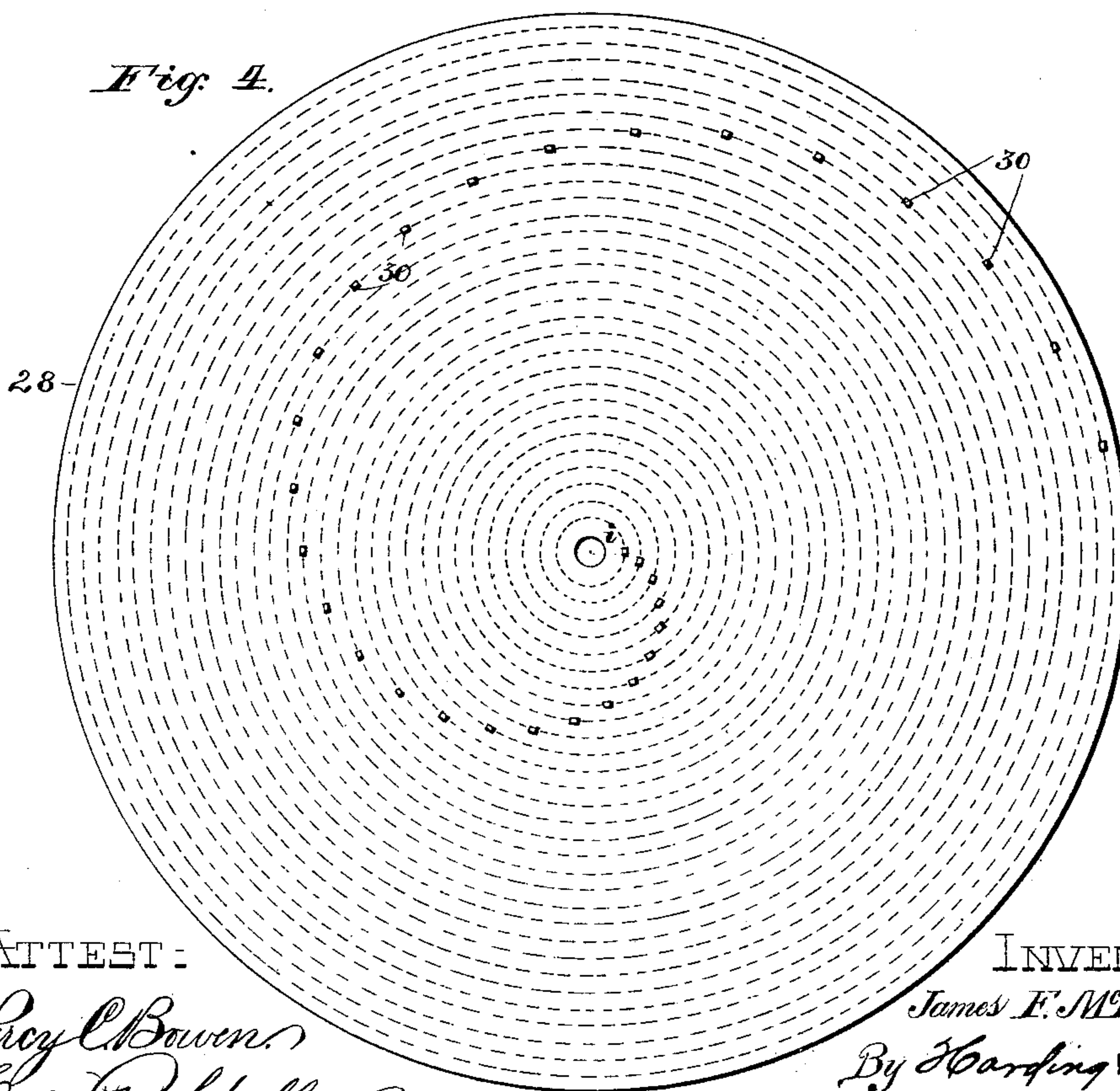


Fig. 4.



ATTEST:

Percy C. Bowen.
Carroll B. Waller

INVENTOR:

James F. McLaughlin.
By Harding & Tichenor.
his Attorneys.

UNITED STATES PATENT OFFICE.

JAMES F. McLAUGHLIN, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRICAL TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 388,141, dated August 21, 1888.

Application filed September 15, 1887. Serial No. 249,784. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McLAUGHLIN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electrical Type-Writers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an electrical type-writer capable of being used either as an independent electro mechanical instrument or as a combined transmitter and receiver for printing-telegraphs.

As an independent electro-mechanical type-writer it consists, essentially, of a mechanically-arranged key-board carrying the ordinary letters, characters, and punctuation-marks necessary for use in machines of this description. The depression of any key thereof will mechanically arrest the rotation of a revolving disk mounted on a shaft which carries the type-wheel with the type-letter corresponding to such depressed key in the proper position to be imprinted on the paper by means of certain auxiliary devices described hereinafter, and such depression at the same instant will effect the closure of a local electrical circuit, by means of which the electro-mechanical printing and letter-spacing mechanisms are operated.

When, as before stated, it may be found desirable or necessary to use my instrument in the capacity of a combined transmitter and receiver, it is only necessary to connect it electrically with a line-circuit by an ordinary lever-switch, each key being so arranged that its depression will cause an imprint of a corresponding type-letter upon the paper roll both of the local receiver and the receiver or receivers at the extremity or extremities of the line or lines. When desirable or necessary to attach or cut out either the local receiving-instrument or the receiver at the end of the line, or both at the same time, certain means for accomplishing this result are provided, as will be more fully explained hereinafter.

The construction and arrangement of the particular parts of this invention are substan-

tially the same when the instrument is used as a local type-writer, as when electrically combined with the transmitter for printing-telegraphs, except when used as a combined transmitter and receiver for printing-telegraphs. In the former instance the key-board is operated mechanically with respect to the type-letters, and in the latter is electro-mechanical.

My invention consists, further, in certain details of construction, arrangements, and combinations of parts and electrical connections, all of which will be more fully described hereinafter, and the particular points of novelty in which will be specifically pointed out in the appended claims.

Referring to the accompanying drawings, which form a component part of this application, Figure 1 is a view in side elevation of my improved machine, the traveling carriage, its separate platform, and the paper-feeding machine all being removed to more clearly illustrate the essential parts of construction. Fig. 2 is a top plan view of the type-wheel, the escapement-disk, the front guide-rest of the platform for the traveling carriage, the ink-reservoir, and the key-board. Fig. 3 is a similar view in which one stop-lug is employed for two key-levers and type letters. Fig. 4 is a detail inverted plan view of the escapement-disk, in which one stop-lug is employed for each and every key-lever and type-letter.

Like numbers and letters of reference indicate like or corresponding parts in all the several views of the drawings.

Before entering into a detailed description of the construction and operation of my invention it would be preferable to here state that the major portion of the construction illustrated and described hereinafter is shown, described, and claimed in my separate concurrent application filed August 24, 1887, Serial No. 247,764, which contemplates the use of these several parts and organizations in connection with a suitable separate transmitting-instrument. Therefore it must be understood that the object of this application is to present an improvement over the aforesaid pending application by utilizing the same parts, with some changes in addition, as a combined transmitting and receiving instrument in one organized machine. Consequently only those

parts which are described and claimed in the other application will be claimed herein as co-operating to produce the result sought to be attained hereby. And, furthermore, it will be hereinafter understood that this invention will be first described as a combined transmitting and receiving instrument, respectively, at two extremities of a line-circuit; and, moreover, it will be again understood that the complete instrument shown in Fig. 1 will be hereinafter referred to as being located at two extremities of the line-circuit; or, in other words, this figure can be made to represent two stations connected by a line-wire.

Referring to the drawings by numbers, 1 designates the key board, which consists of a series of pivoted current-conducting key-levers, 2 2, having curved forward portions 3 3, carrying the keys 4 4, which latter bear the symbols of the key-board, and the rear extremities, 5 5, of said key-levers 2 2 are all of exactly the same length, and are each provided at their extreme ends with enlarged weighted portions 6 6, having the upwardly-extending studs or lugs 7 7. (See Figs. 1 and 2.)

At the junction of the front and rear portions, 3 and 5, in each key-lever 2 2 is formed a perforation, through which is inserted the pivot-rod 8, which acts as the fulcrum point or support of all of the said key-levers.

9 represents a single casting, two of which are screwed to the base 11 of the instrument, as shown in Figs. 1 and 2, and serve, respectively, as guide-supports for the key-levers 2 2 and as bearings for the pivot-rod 8, to which latter is fulcrumed the series of key-levers, as before stated, and as shown clearly in Fig. 1. Each casting comprises a curved base, 10, forming a segmental line or cord across the upper surface of the circular base 11, and an upright portion, 12, of sufficient height to support the pivot-rod 8 the requisite distance above the said base. In the top edge or face of this portion 12 is located a longitudinally-curved recess (shown partly in Fig. 2) extending the entire length thereof, the object of this construction being to form a bed for the pivot-rod 8 and to furnish a space intervening between the said pivot-rod and the bottom of the recess, so as to allow a certain play for each lever at its fulcrum-point. Transversely in the top face or edge of this portion 12 are formed a series of inclined recesses, 13 13, which intersect the longitudinal recesses and correspond in number to the number of key-levers 2 2, which latter are each perforated at their fulcrum-points and are slipped over the pivot-rod 8, fitting in and being guided by the recesses 13 13, (see Fig. 2,) thereby forming an arc or fan shaped key-board for the purpose of affording convenience in manipulation. However, it will be obvious that the key-board might be arranged in any other desirable or suitable manner without departing from the spirit of my invention. The two castings are each of metal

and are electrically connected together by a suitable wire. (Not shown.)

Directly underneath the key-board and upon the supplementary base 11 of the instrument is secured the guard-plate 16, which extends transversely under the said key-board and forms a limiting medium for the play of the key-levers, which are, as shown in Figs. 1 and 2, provided with the adjusting-screws 17 17, so inserted in the said key-levers intermediate of the keys 4 4 and the fulcrum-points as to adjust the distance that any key-lever can be depressed at will. As before stated, the rear free extremities of all the key-levers are each provided with an enlarged portion, 6, which serves as a retracting agency for any one of said levers after it has been released from the finger of the operator; and each portion 6 is provided with an upwardly-projecting metallic escapement pin or lug, 7, which is tipped on its upper surface with insulation 17^a, the sides of each of said lugs being left bare, (electrically exposed,) so that the proper electrical contact may be made therewith in the manner hereinafter explained.

A lip, 19, projects outwardly from the inner side of the casting 9, and a binding-post, 18, provided with a lateral-extending spring contact-plate, 20, is screwed down through the said lip 19 for electrically connecting the two castings with a battery, 15, and the plate 20 is designed to make contact with the pivoted switch-lever 21 (similar to the circuit-closer of the key of a Morse instrument) when the machine is used as an automatic receiver, as will appear subsequently. A metallic vertical shaft, 22, passes centrally through the machine, as shown in Fig. 1, and is mounted in suitable bearings in the bases 11 and 23 and in the frame-work of the elevated platform, which latter supports the traveling carriage. (Not shown.) Upon the upper extremity of this shaft 22 is secured the rotatable type-wheel 24, around the periphery of which are disposed the letters, symbols, or characters necessary for use in printing, the said letters, symbols, and characters being arranged equidistant from each other, and leaving at one point upon the periphery of the said type-wheel a space, 24^a, (see Fig. 2,) equal to the distance between two alternate letters, the object of which will be described hereinafter. This type-wheel is centrally perforated and is inserted over the screw-threaded end of the shaft 22, resting upon and supported by the shoulder or collar 25. This type-wheel is rigidly keyed upon its shaft between the nut 26 and the collar 25.

27 designates a horizontal journal-bracket secured to the frame-work of the elevated platform, and provided at one end with the fastening-screw 28^a and at the other extremity with the clamp-screw 29, which latter fits in a diamond point in the upper end of the shaft 22, forming the other journal-bearing therefor.

Centrally on the shaft 22 is rigidly mounted

a thin metallic disk, 28, of larger diameter than the type-wheel, having its under plane circular surface studded with a series of spirally-disposed stop lugs or pins, 30, which are so relatively arranged as to have different radial distances from each other, no one stop-lug occupying the same distance from the center *i* of the disk 28. (See Figs. 3 and 4.) Thus it will be understood that while the disk 28 is revolving should one of the lugs 30 come into contact with any affixed or adjusted obstructions—say, for example, one or more of the escapement-lugs 7 7 of the key-levers 2 2—the said obstruction or obstructions would only lie in the path of that particular stop-lug, since the said stops are spirally arranged at a different and relative distance from the center of the disk.

Each stop-lug 30 is intended to represent one or more corresponding type-letters on the periphery of the type-wheel 24, and each of said stops occupies a relative position on the under surface of the disk 28 with regard to its corresponding type letter or letters on the periphery of the type-wheel, as will be clearly explained hereinafter. In one case, as shown in Fig. 3, each lug represents two letter-type on the type-wheel 24—that is to say, any two respective type-letters which are represented by a single and corresponding stop-lug 30 are arranged both with relation to each other and with their corresponding stop 30 on the periphery of the type-wheel. Suppose, for example, the lug marked *g* in Fig. 3 is intended to represent two letter-type on the type-wheel, such as M' and N'. Now, in order to clearly comprehend the relative construction of these several parts it must be first understood that all of the several key-levers 2 2 terminate at their free rear extremities exactly on a line corresponding to a transverse diameter of the disk 28; or, in other words, the ends of all the key-levers when viewed as illustrated in Fig. 1 are in the same vertical plane, or their longitudinal or basis line of that plane runs diametrically through the disk 28. Again, it will be understood that inasmuch as the disk 28, whose shaft is designed to be revolved in unison with the shaft (not shown) at the other extremity of the line, is rigidly keyed to the shaft 22, and that the type-wheel is also similarly keyed to this shaft, the relative positions of the corresponding stop-lugs 30 and the type-letters will be uniformly maintained during the revolution of the shaft; and, furthermore, it will be apparent that when any one lug meets the obstructing end 7 of any key-lever the type-letter corresponding to such key-lever and the lug must be opposite to the impact-lever 29. Now, in order that these requirements may be fulfilled, the relative arrangement of the key-levers, stop lugs, and letter-type is as follows: Take the stop-lug marked *g* in Fig. 3 and designate the same as corresponding to both letters N' and M'. Then, in this instance, there will of course be two key-levers of the key-

board for engaging and stopping the revolution of this one lug *g*, one key-lever bearing the letter N' and the other, M'; and, inasmuch as the lug *g* is farthest from the center of the disk 28, the end of each key-lever marked, respectively, M' and N', in Fig. 2, would be separated from the other a distance equal to the diameter of a circle which has a radius equal to the distance from the lug *g* to the center *i* of the disk 28. Consequently, this lug *g*, having been engaged and released by the key-lever marked M' in Figs. 1 and 2, would not come in contact with the lever marked N' in Fig. 2 until it (the lug) had completed one-half of its revolution—*i.* A line, such as *xx*, drawn diametrically through the disk 28 from the lug *g*, would intersect the circle *h* at the point where this lug *g* would come into engagement with the key N'. By an inspection of Fig. 3, it will be seen that the line *xx* passes centrally between any two lugs on the opposite side of the disk 28, the object of which construction will appear hereinafter. As shown in Fig. 2, the diametrical line *yy*, drawn from the end of the impact-lever 29 through the type-wheel 24, would be identically at right angles with the horizontal line *zz* marking the vertical plane of the ends of the key-levers, and since each stop-lug 30 must engage each lug 7 of its respective key-lever, no matter on which side of the disk 28 the engagement takes place, at a point coincident with this horizontal line *zz*, and, since the particular type-letter on the type-wheel which corresponds to its lug 30, which is engaged by any key-lever depressed, must be coincident with the end of the impact-lever 29 at the time its respective lug is stopped, it will be seen that each type-letter is located on the periphery of the type-wheel at a point at right angles with its respective stop-lug, provided that the two disks were in the same horizontal plane, and the type-wheel was bounded by the disk 28, as conventionally exemplified in Fig. 2, and inasmuch as each stop-lug 30 represents two type-letters on the type-wheel 24, and as any two type-letters represented by a single lug are diametrically opposite to each other in relative location, to accord with the relative location of the ends of the two key-levers which correspond to these two type-letters and one lug, it will be obvious that no other lug 30 on the opposite side of the disk must be coincident with the horizontal line marking the ends of the key-levers at the time a stop-lug is engaged by a key-lever. Accordingly such provision is made by the construction shown in Fig. 3. However, in practice it may be desirable to have a stop-lug 30 for each key-lever and letter-type, and to meet such requirement I have devised the construction of disk shown in Fig. 4.

From the foregoing description and accompanying illustrations it will be conceded, first, that I am able to provide a key-board carrying both upper and lower case, and a type-wheel having the corresponding type letters or

characters disposed therearound; and, second, to thereby effect the imprint of both the upper and lower case with stop-lugs equal in number to either one-half or the whole of the key-levers and type-letters.

Each of the key-levers 22 is made of metal, and, as before stated, is bent up at its fulcrum-point, as shown in Fig. 1, the rear portion thereof being in a different horizontal plane from the front portion, for the obvious purpose of being on a nearer plane with the under plane of the revolving disk 28, so that a depression of any key will not necessitate much play or vertical reciprocation of a lug, 7, in order that it may engage an escapement-pin 30 on the disk 28.

The impact-lever 29 is of a curved or hook shape, as shown, to conform both to the size of its reciprocating space and to the character and location of the adjacent parts of the instrument. This lever is pivotally supported at its lower end by the screw 31, which bears in a suitable recess in the frame or bracket 32.

33 designates a vertical plate which projects up from and is formed integral with the lever 29 and carries the armature 34 of the electro-magnet 35, which in turn is suitably attached opposite to its armature upon the frame 32.

36 designates an adjusting-screw secured through the vertical plate 37 for limiting the movement of the impact-lever.

The binding post 18 is connected with one pole of the battery 15 by the wire 38, and the switch-lever 21, which is adapted to make engagement with the plate 20 of the binding-post 18, is electrically connected by the wire 39 with the brush 40, which bears upon the collar 41 of the vertical shaft 22, the said brush 40 being in turn connected with the electro-magnet 35 by the wire 42, and the electro-magnet 35 is connected by wires 43 and 45 with the spacing-magnets 44. The spacing-magnets 44 of the electro-mechanical step-by-step mechanism for advancing the traveling carriage at a determinate instant after each imprint is made is connected by wire 48 with the electro-magnet 49, which in turn is connected with the binding post 50 by wire 51. The binding-post 50 is in circuit with the button-switch 52 by wire 53, and with the switch-terminal 54 by wire 55, the other switch-terminal, 56, being connected with the bell 57 by wire 58, and the bell connected to the ground by wire 59. The lever 60, which is adapted to make contact with the switch-terminals 54 and 56, is in circuit with the line.

Upon the base of the instrument is secured the electro-magnet 49, having its lower pole converted and brought up parallel with the side of the magnet-helix over, above, and in close proximity to its upper pole, forming, substantially, an elbow-shaped frame; and centrally in the magnetic field, between the said poles of the electro-magnet 49, is designed to revolve the soft-iron armature-disk 61, which in turn is keyed rigidly to the shaft 22 by the collars 62 62, this construction forming the

electro-magnetic unison device for arresting the revolving central shaft of one instrument simultaneously with the depression of another separate and distant instrument, as will be clearly explained in the operation. One of the stop lugs 30 upon the disk 28 is arranged to correspond with the space 24^a on the periphery of the type-wheel 24 in such a manner that the said space 24^a will stop opposite to the impact-lever 29, when its corresponding lug 30 comes into contact with the upwardly-projecting lug 7 of the spacing-key 63.

64 designates the front guide-rest of the elevated platform of the traveling carriage, and 65 is a rectangular receptacle located underneath and supported by the front guide-rest 64, and is provided with the lid 66, for gaining access to the conical receptacle 67, which contains the ink for coating the rollers 68 68, the said rollers being in slight contact with the edge of the type-wheel 24.

For the sake of clearness I have shown the automatic electro-magnetic letter-spacing motor for advancing the traveling carriage (not shown) step by step at a determinate instant after each type-impact has been made, together with other non-essential details of construction; but these features will not be further dwelt upon herein, as they form the subject-matter of several concurrent and future applications.

The spacing-magnets 44, being included in the main circuit, must be arranged to operate the traveling carriage at a determinate instant after the action of the impact-lever magnet without impeding the passage of the current, which arrangement can be effected in a variety of ways; but I prefer adjusting the retractile spring of the armature so that the combined tension of the spring and the weight of the armature will serve to make the mechanical action resulting from the magnetic force of attraction of said spacing-magnets subsequent to the action of the impact-lever.

The operation of my invention when used as a combined transmitting and receiving instrument is as follows:

In giving a detailed and comprehensive elucidation of the function of my instrument it will have to be understood, as before stated, that the organization of apparatus illustrated in Fig. 1 must be used to represent two distinct and separate stations, and with this understanding the operation will now be described. The instrument being in the position shown in Fig. 1, with the switch-lever 21 and the button-switch 52 thrown open, and the arm 60 upon the switch-terminal 54, and the operator desires to convey a message—say, for example, the words “dynamograph machine”—over the line to a distant station, Fig. 1, he successively depresses the keys of the instrument composing the stipulated message. Now, in order to clearly follow the operation, we will suppose that the first key depressed is the one lettered A, in Fig. 1. Consequently the depression of said key elevates the rear ex-

tremity, 5, of said key-lever until the lug 7 is
 in line with the particular lug 30 which corre-
 sponds to the letter D on the type-wheel. Then
 the revolving disk 28 will instantaneously
 5 force its lug 30 against the lug 7 of this lever 2,
 thereby stopping said disk with the letter D op-
 posite to the impact-lever 29. Now, at the same
 time that this lug 30 engages the end of the le-
 ver 2, the circuit will be instantaneously closed
 10 from the battery 15, wire 38, binding-post 18,
 lip 19, casting 9, rear portion, 5, of the lever 2,
 lug 30, shaft 22, the brush 40, the wire 42, to
 the magnet 35, energizing said magnet and
 causing the attraction of its armature 34, and
 15 consequently forcing the rubber-tipped end of
 the impact-lever against the paper (not shown)
 and effecting the imprint of the type-letter
 D thereupon at the same instant the said
 type-letter is stopped at the impact-point by
 20 the engagement of key-lever with its lug 30.
 Then the same impulse, discharged from the
 battery 15 through the magnet 35, passes in-
 stantaneously over its path 43 and 45 to the
 spacing-magnets 44 and energizes the latter
 25 and effects the operation of the letter-spacing
 mechanism at a determinate instant after the
 imprint is made upon the paper, said spacing-
 magnets being of a higher resistance than the
 magnets 35. Now the impulse imparted by
 30 the depression of the key A having, as just
 described, energized the magnets 44, it will
 pass through the wire 48 into the magnet 49,
 energizing the same and effecting the attrac-
 tion of the disk 61; but the shaft 22 having
 35 been previously arrested in its revolution, this
 latter action will be unnecessary at this sta-
 tion, and the same impulse, after energizing
 the magnet 49, will traverse the wire 51, bind-
 ing-post 50, wire 55, switch-terminal 54,
 40 switch-arm 60, over the line to the instrument
 located at the other extremity of the line. Now,
 it being understood that Fig. 1 convention-
 ally represents the said station at the distant
 extremity of line, the impulse which has passed
 45 over the line will enter through switch-arm
 60, switch-terminal 54, wire 55, binding-post
 50, wire 51 to the magnet 49, energizing said
 magnet and arresting the rotation of the shaft
 22 at the same instant that the impulse was
 50 imparted at the other end of the line, with the
 letter D upon the type-wheel opposite to the
 impact-lever 29, in the same manner as de-
 scribed with reference to the first-mentioned
 station. Then the current instantaneously
 55 traverses its path 48, spacing-magnets 44, wires
 43 and 45, into magnet 35, energizing said mag-
 net and causing the attraction of its armature
 34 and the consequent stroke of the impact-
 lever 29, thereby effecting another and similar
 60 imprint of the letter D upon the paper. Then
 the spacing-magnets 44 being arranged as be-
 fore stated, the traveling carriage will be ad-
 vanced one letter space at a determinate in-
 stant after this imprint is made at such distant
 65 extremity, the impulse passing simultaneously
 from the magnet 35, through wires 42 and 39,
 switch-lever 21, binding-post 18, wire 38, bat-

tery 15, to ground, the said switch-lever 21 be-
 ing closed at such distant extremity, in order
 that the impulse may find a closed circuit 70
 through the distant instrument. The operator
 at such distant extremity of the line is notified
 to close the switch-lever 21, in order to auto-
 matically receive, by having his switch-arm
 60 normally on the switch-terminal 56 of the 75
 bell 57. Thus, when a preliminary impulse
 is sent from the local station to a distant ex-
 tremity, such impulse will ring the bell 57 and
 thereby notify the receiving operator to close
 his switch 21 and to change his switch-arm 60 80
 upon the switch-terminal 54. Thus the oper-
 ation is repeated until the end of the word
 "dynamograph" is reached. The operator
 now being desirous of making a space between
 the words completed ("dynamograph") and 85
 the next word to be printed, ("machine,")
 he depresses his spacing-key 63, Fig. 2, there-
 by causing the stop-lug 30 corresponding to
 the space 24^a on the type-wheel to come into
 contact with the upwardly-projecting lug 7 90
 upon the said lever 63, thereby stopping the
 type-wheel with the space 24^a opposite the im-
 pact-lever 29. The path of the electric cur-
 rent will now be identical with that herein-
 before described in connection with the de- 95
 pression of a letter-key, and the operation of
 the several parts will be the same as in that
 instance, with the exception that the impact-
 lever 29 cannot force the paper against the
 type; and the said impact-lever being so ad- 100
 justed that it can move forward only a suffi-
 cient distance at each stroke to come in contact
 with the face of the type, it will be seen that it
 will not force the paper against the type-wheel,
 but will simply strike the back thereof and 105
 produce no imprint whatever, while the space
 will be made in the same manner as when a
 letter-key is depressed. Thus it will be un-
 derstood that the operator transmits the de-
 sired message over the line and at the same 110
 time records the said message at both extren-
 ities by means of the instrument shown in Fig.
 1. Should it now be desired to use the in-
 strument locally, it is only necessary to change
 the switch-arm 60 to the switch-terminal 56 115
 and close the button-switch 52. When the
 traveling carriage reaches the end of a print-
 ed line through the agency of the electro-
 mechanical letter-spacing motor, it is auto-
 matically recoiled and the paper-feeding and 120
 line-spacing devices are instantaneously oper-
 ated. However, the mechanism for accom-
 plishing these results, although partly illus-
 trated, will not be described in detail for rea-
 sons above stated. 125

Of course, it will be understood that the
 shaft 22 of the instrument is rotated in uni-
 son with the shaft or shafts of the instru-
 ment or instruments at any terminal or inter-
 mediate stations by means of a synchronal 130
 motor. However, I deem it preferable to use
 for this purpose the motor shown and described
 in my patent, No. 368,411, dated August 16,
 1887; but any operative unison device may be

substituted. As the type-wheel is revolved, it is continually in contact with the ink-roller shown in Fig. 1.

Having thus fully and accurately described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. An electrical type-writer comprising a circuit-controlling key-board, a current-conducting revolving stop-disk controlled by said key-board, a local circuit also controlled by said key-board, a main-line circuit, and switches and connections for connecting and disconnecting the main and local circuits.

2. An electrical type-writer comprising a circuit-controlling key-board, a current-conducting revolving stop-disk controlled by said key-board, a local circuit including printing mechanism, and also controlled by said key-board, a main-line circuit, and switches and connections for connecting and disconnecting the main and local circuits.

3. An electrical type-writer comprising a series of circuit-controlling key-levers, a current-conducting disk provided with a series of stops and arranged to be arrested by the movement of any key-lever, an electric circuit including said key-levers and disk, and operated also by a movement of any key-lever, an electro-magnetic unison brake, also included in said electric circuit, and a revolving armature-disk controlled by said brake.

4. An electrical type-writer comprising a circuit-controlling key-board, a current-conducting revolving stop-disk controlled by said key-board, a local circuit including letter-spacing mechanism and also controlled by said key-board, a main-line circuit, and switches and connections for connecting and disconnecting the main and local circuits.

5. An electrical type-writer comprising a series of circuit-controlling key-levers, a revolving current-conducting disk provided with a series of stops and arranged to be arrested in its rotation by a movement of any key-lever, an electric circuit including said key-lever and disk, and operated also by a movement of any key-lever, electro-magnetic printing mechanism, substantially as described, included in and controlled by said electric circuit, an electro-magnetic unison-brake, also included in and controlled by said electric circuit, a revolving armature-disk controlled by said brake, and electro-magnetic spacing mechanism, substantially as described, also included in said electric circuit and arranged to be operated at a determinate instant after the operation of the printing mechanism.

6. In a printing-telegraph, two or more instruments located, respectively, at two or more stations of a line circuit, and each comprising, essentially, a series of circuit-controlling key-levers, a rotary current-conducting

disk and type-wheel upon a common shaft, an electro-magnetically-actuated printing-lever, an electro-magnetic unison-brake controlling the rotation of said shaft, and electro-magnetic spacing mechanism, substantially as described, in combination with a line-circuit, including said key-levers, disk, and the actuating electro-magnets of the brake, printing-lever, and spacing mechanism, and a synchronal motor for revolving the shafts of the respective instruments.

7. In a printing-telegraph, two or more instruments located, respectively, at two or more stations of a line-circuit, and each comprising, essentially, a series of circuit-controlling key-levers, a rotary current-conducting disk and type-wheel upon a common shaft, an electro-magnetically-actuated printing-lever, an electro-magnetic unison-brake controlling the rotation of said shaft, and electro-magnetic spacing mechanism, substantially as described, in combination with a line circuit, including said key-levers, disk, and the actuating electro-magnets of the brake, printing-lever, and spacing mechanism, a synchronal motor for revolving the shafts of the respective instruments, switches, annunciators, and circuit-connections for the line-circuit.

8. In a printing-telegraph, two instruments located, respectively, at two stations of a line-circuit, and each comprising a series of circuit-controlling key-levers, a revolving current-conducting disk provided with a series of stops, whereby it may be arrested in its rotation by a movement of any key-lever, and an electro-magnetic unison brake controlling the rotation of said stop-disk, in combination with a line-circuit including the said key-levers, stop-disk, and the actuating electro-magnets of said brake, and switches and circuit-connections for said line-circuit.

9. In a printing-telegraph, two instruments located, respectively, at two stations of a line-circuit, and each comprising a series of circuit-controlling key-levers, a revolving current-conducting disk provided with a series of stops, and a type-wheel rotating in fixed relation to said disk upon a common shaft, said disk being arrested in its rotation by a movement of any key-lever, a synchronal motor for said shaft, and an electro-magnetic brake also controlling the rotation of said shaft, in combination with a line circuit, including said key-levers, disk, and the actuating electro-magnet of the said brake, and switches and circuit-connections for the said line circuit.

In testimony whereof I affix my signature in presence of two witnesses.

J. F. McLAUGHLIN.

Witnesses:

GEO. H. TICHENOR,
PERCY C. BOWEN.