P. ETIENNE.

TRANSMITTER FOR SYSTEMS OF ELECTRICALLY RECORDING SIGNS.

APPLICATION FILED NOV. 7, 1912.

1,142,684.

Patented June 8, 1915.

3 SHEETS—SHEET 1.

Fig. 1.

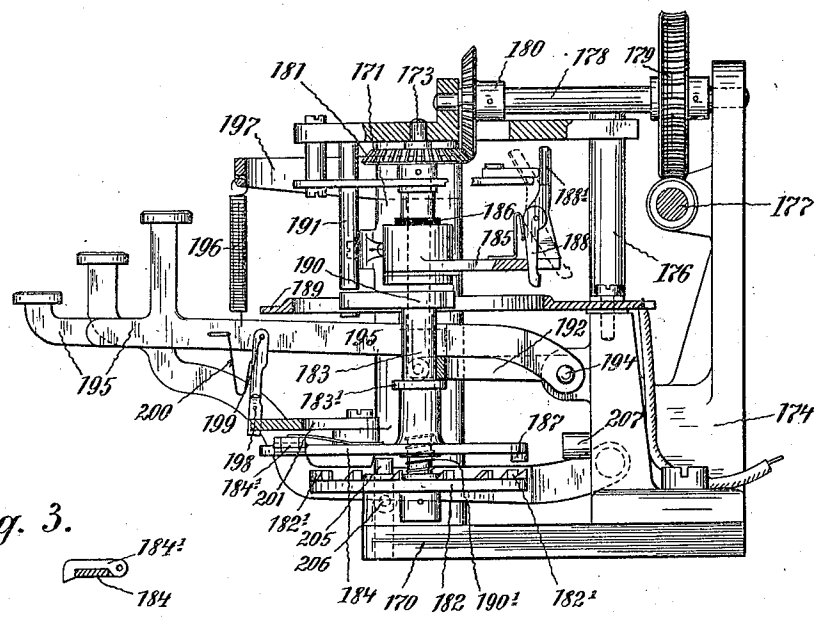


Fig. 3.

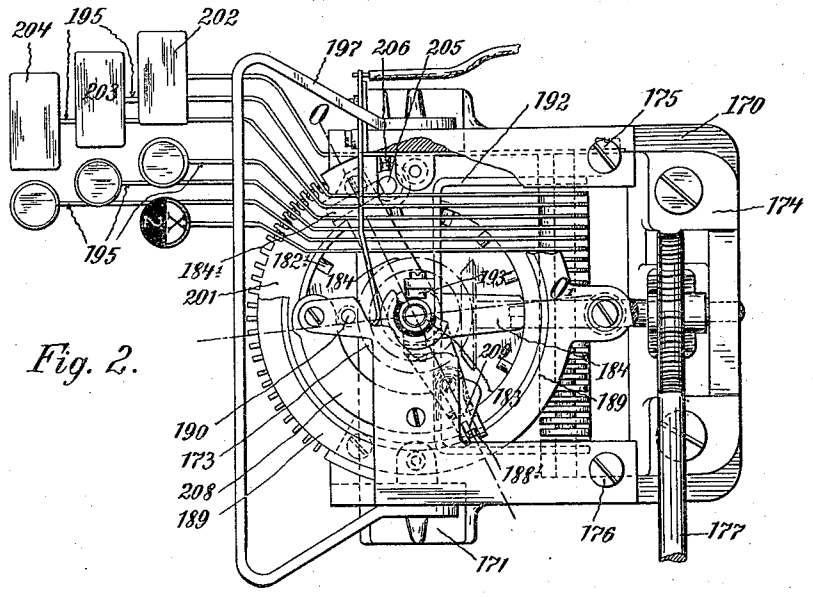


Fig. 2.

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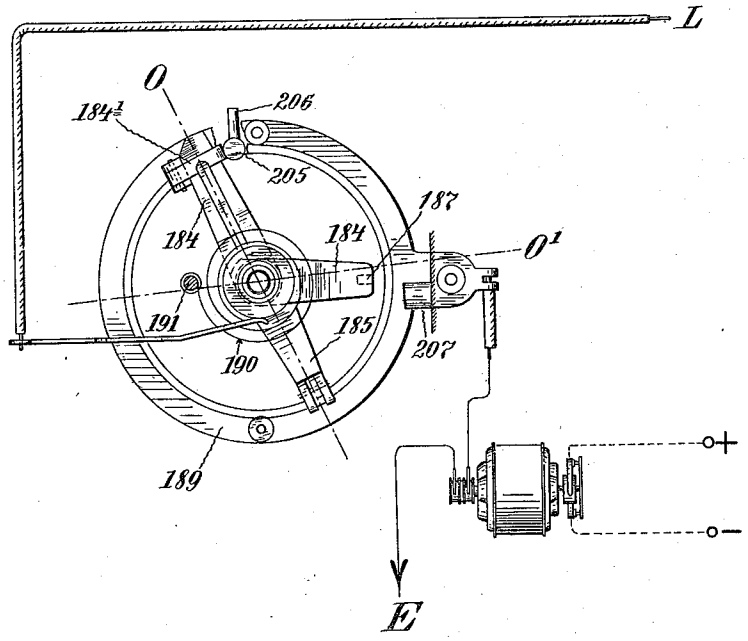
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3 SHEETS—SHEET 2.

Fig. 4.



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3 SHEETS—SHEET 3.

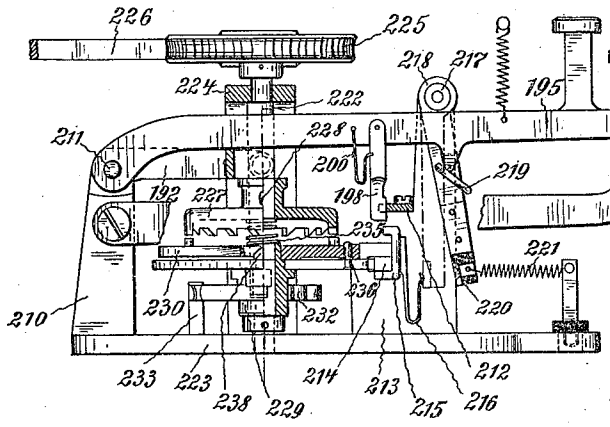


Fig. 5.

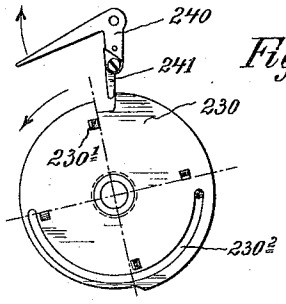


Fig. 7.

Fig. 6.

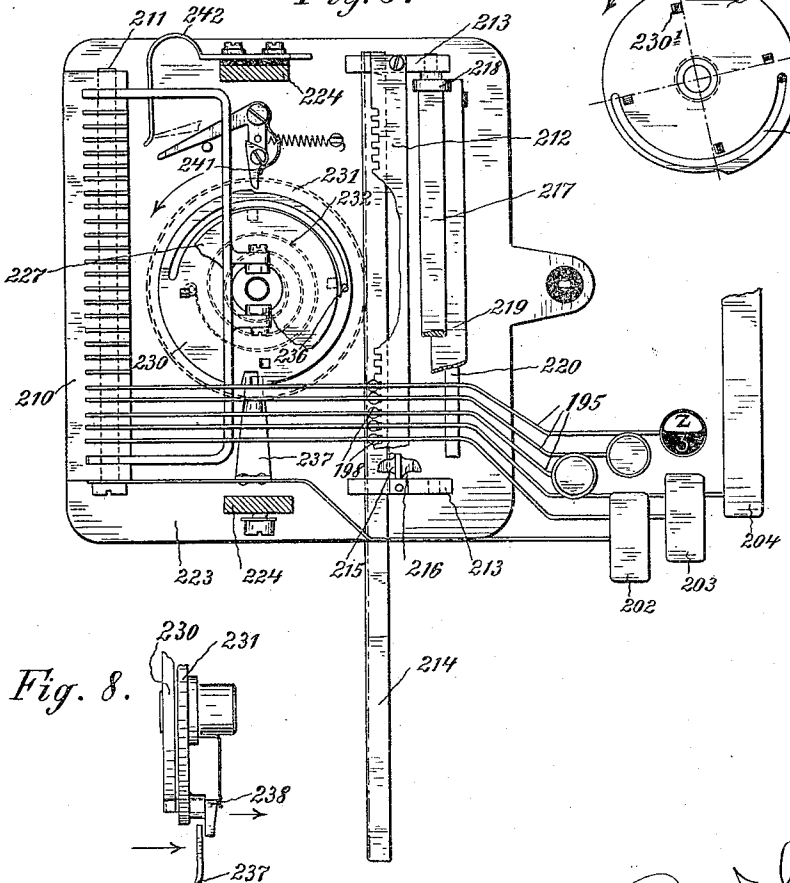


Fig. 8.

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UNITED STATES PATENT OFFICE.

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TRANSMITTER FOR SYSTEMS OF ELECTRICALLY RECORDING SIGNS.

1,142,684. Specification of Letters Patent. Patented June 8, 1915.

Original application filed August 19, 1911, Serial No. 644,955. Divided and this application filed November 7, 1912. Serial No. 730,047.

To all whom it may concern:

Be it known that I, PAUL ETIENNE, a citizen of Switzerland, and a resident of St. Imier, in Switzerland, have invented certain new and useful Improvements in Transmitters for Systems of Electrically Recording Signs, of which the following is a specification.

My invention relates to transmitters for systems of electrically recording signs, and more particularly to transmitters by means of which a definite number of current impulses are produced by depressing one of a set of keys and transmitted over a line to a receiving apparatus. A transmitter of this kind is for example adapted for coöperation with a receiving apparatus of the class shown and described in my copending application for patent Ser. No. 644,955, filed August 19, 1911, for telegraphic typewriting systems.

The object of the improvements is to provide a transmitter which is simple in construction and reliable in operation, and which is adapted to perform all the functions required for writing by means of electrical transmission.

With this object in view my improved transmitter comprises a set of keys representing the signs to be sent over the line and a continuously rotating controlling shaft. By depressing one of the keys the line circuit is closed, until by the rotation of the shaft a member of the key lever which has been depressed by the said key is struck and released by an abutment member.

My invention also relates to various details of construction described hereinafter and particularly pointed out in the appended claims, reference being had to the accompanying drawings and the letters of reference marked thereon.

In said drawings—Figure 1, is a longitudinal section of the transmitter, Fig. 2, is a plan thereof partly in section, Fig. 3, is a cross-section showing a detail, Fig. 4, is a plan view showing the principal member and the electrical connections of the transmitter, Fig. 5, is a longitudinal section similar to that shown in Fig. 1, and showing a modification of the transmitter, Fig. 6, is a plan view of Fig. 5 partly in section, and Figs. 7 and 8, are respectively a plan view and a side view of details.

The same letters of reference have been used in all the views to indicate corresponding parts.

My improved transmitter resembles somewhat in appearance an ordinary typewriting machine.

173 is a vertical shaft journaled in a base plate 170 and in an angular piece 171 screwed fast to the base plate.

175 and 176 are two columns which connect the supporting trestle 174 with the angular frame 171. A rotary converter or generator not shown in the drawing and giving out alternating current is coupled to the worm shaft 177 which, by means of the worm wheel 179, the shaft 178 and the miter gear wheels 180, 181, transfers its rotary motion to the upright shaft 173. Rigidly fixed to the upright shaft is a coupling disk 182 which has a number of teeth 182^1. Loosely mounted on the upright shaft is a sleeve 183 with two arms 184 and a contact arm 185. The contact arm is insulated from the shaft by a sleeve of a hard rubber 186. The shorter one of the two arms 184 has a tooth 187 while the other arm carries a hinged piece 184^1 the bottom end portion of which has a slanting surface. The hub of the insulated contact arm 185 serves as a current collector taking the current from a brush wiping on its periphery. The contact arm 185 carries a swinging contact brush 188 which on being swung out of the position in which it is represented in Fig. 1 makes contact with the inner surface of the insulated ring 189 fixed to the supporting trestle 174 and to the frame 171. The whole sleeve 183 is held in its normal rotary position by a clock spring 190 attached to the pin 191, the normal vertical position being secured by a spring 190^1.

192 is a bow pivoted at its ends on the horizontal axis 194 and rests with its two small steel rollers 193 on a round ledge 183^1 of the sleeve 183.

Arranged above the bow 192 and also pivoted on the axis 194 are a number of key levers 195. Each of these keys is held in its normal upper position by a spring 196 attached to a supporting bar 197 and each key has attached to it a latch 198 pivoted on a pin 199 and urged inward against a holding ring 201 by a spring 200. On a lever 195 being depressed the bow 192 is also pressed down it in turn depressing the sleeve 183 with the arm 184 and the contact

arm 185. This causes the tooth 187 of the arm 184 to be caught by one of the teeth of the constantly rotating coupling disk 182 which then carries the arm 184 around with it until it strikes the latch 198. This latch which was forced inward and locked the key fast to the ring 201 when it was depressed is then pushed outward so that the key is liberated and the sleeve 183 allowed to rise into its normal position. When the key rises the arm 184 is uncoupled from the disk 182 and is turned back into its normal position by the spring 190. While the arm 184 was coupled to the disk 182 the contact arm 185 was making contact with the ring 189 and current was sent over the line during an interval corresponding to the angle through which the arm 184 was turned. As the catches 198 are distributed at equal distances from each other around the circumference of the holding ring 201 the size of the angle through which the arm 184 is turned and the number of alternations of current sent over the line is determined by the key depressed. The keys with rectangular finger plates shown in Fig. 2 are intended for three special functions. The key 202 is the key for changing over from the one sign shown on any key to the other sign. Key 203 is the line space key or the key that is depressed when it is desired to commence a new line. Key 204 is the letter space key or the key used for leaving an unwritten space between two words. In the description of the receiver it was said that, on a certain small number of alternations being sent through the receiver, the typewheel is caused to fly into its normal position at the left hand end of its supporting shaft and the paper strip is simultaneously shifted on to the next line of writing. This certain small number of impulses is produced by the key 203 and when this number of impulses flows through the receiver no sign is printed, but the typewheel is caused to return to its normal left hand position. The word space key 204 produces a number of alternations which corresponds to a free space on the typewheel the preferred arrangement being to make this key send one more alternation than the line space key 203, the catch 198 of the word space key being one division farther along the circumference of the holding ring 201. By depressing the sign changing key 202 the arm 184 is caused to turn back (*i. e.* clockwise in Fig. 2) into a different starting position so that, when a key is depressed after the depression of the sign changing key, the arm 184 is made to turn through a greater angle than it would if it were depressed without the previous depression of the sign changing key, the path described by the arm 184 being always increased through depressing the sign changing key to the same extent, this amounting to the distance from the normal starting point back to the fixed special starting point. By the arm 184 being made to turn through a certain additional angle, a determined additional number of alternations are sent out by the transmitter, which cause a different part of the type-wheel to be turned into the printing position. To bring about the described increased angular movement and the consequential additional impulses, the stop 205 at the normal starting position of the arm 184 is made depressible so that, on the sign changing key 202 being pressed down the pin 206 causes the stop 205 to sink into the base plate 170. The hinged piece 184^1 on the arm 184 will then no longer press against the stop 205 and the arm 184 will be swung around by the action of the spring 190 until it strikes against the fixed stop 207 (Figs. 1 and 4).

If an ordinary key *e. g.* the key $\frac{x}{2}$ be now depressed the arm 184 will commence moving from the special starting point 0_1 instead of from the usual point 0 (Figs. 2 and 4). The number of alternations sent over the line will consequently be increased by the number which corresponds to the angular distance from 0 to 0_1.

Provision must be made for closing and opening the circuit precisely at the moment the arm 184 begins to turn or is stopped respectively, as otherwise an incorrect number of alternations could be sent out. This would happen for instance if contact were made shortly before the teeth 182^1 commenced taking the tooth 187 around. It is also important to break the circuit suddenly to prevent injurious sparking. To this end the contact brush is furnished with a tail 188^1 which when in its normal position, rests against the arm 209 pivoted to the segment 208 and keeps the contact brush a certain distance away from the contact ring whenever the sleeve 183 is being depressed. But as soon as the disk 182 carries the arm 184 around with it the tail 188^1 leaves the arm 209 and the contact brush 188 is tilted over and brushes against the inner circumference of the contact ring 189 until the arm 184 is uncoupled again. By this contrivance not only exactitude in number of alternations sent is insured but it also constitutes a means of closing the sending circuit before the maximum current strength in the first alternation is reached, which is very desirable when one transmitter operates large numbers of receivers. The contact brush 188 is returned into its normal vertical position by brushing against the segment 208 which is adequately sloped to perform this function.

In case the sign changing key is used that is, when the arm 184 is rotated in a backward direction into the special starting position 0_1, the tail 188^1 strikes against the left

hand projection of the segment 208, so that also when the sign changing key is used the circuit is not closed until the arm 184 commences being carried around by the coupling disk 182. By fixing the buffer 184^1 that knocks against the stops on a hinge and by giving this buffer a slanting bottom surface at its free end, the arm 184 is enabled to pass the ordinary stop 205 whenever it starts moving from its special starting position 0_1 and the stop 205 has been allowed to rise before the arm 184 has passed it. In such cases the buffer 184^1 is flipped upward on its hinge when it reaches the stop 205 and moves over it without the progress of the arm 184 being arrested.

The transmitter shown in Figs. 5 and 8 works on the same principle as the transmitter described above, differing only in the arrangement of its parts. The parts in this modification which correspond with parts described above are furnished with similar signs of reference. The principal difference consists in the catches 198 attached to the key levers 195 pivoted in the axis 211 being arranged in a straight row. These catches fit loosely in notches cut into a straight holding bar 212 which is fixed to supports 213 which also serve as guides for a sliding rack 214 having teeth (not shown in the drawing) on its left side. Attached to the sliding rack 214 is a stop 215 which limits the motion of the sliding rack by striking against the support 213. The closing of the circuit in transmitting a message is done with the aid of a contact spring 216 attached to the rack 214 this spring being arranged to make contact with a contact strip 220 which is insulatingly fixed to a rockable contact making device consisting of the shaft 217, the arms 218 and a slanting cross bar 219, this contact making device being normally kept away from the contact spring 216 by a retractile spring 221. The vertical shaft 222 is pivoted in the base plate 223 and in the arc-shaped support 224 and carries a rigidly fixed worm wheel 225 (Fig. 5). The worm wheel is rotated by the shaft 226 which is turned by a rotary converter or equivalent machine not shown in the drawing. The shaft 222 in turning carries the coupling disk 227 around with it by virtue of a pin 228 that projects into a slot in the hub of the disk. The disk can move vertically on the shaft 222 the extent of its vertical movement being determined by the length of the slot surrounding the pin 228. A sleeve 229 which is rigidly fixed to a disk 230 fits loosely on the shaft 222. The disk 230 has four fixed teeth 230^1 and a semi-circular slot 230^2 into which a pin 236 protrudes which is fixed to a toothed wheel 231 located beneath the disk 230. A spring 232 whose one end is attached to the pin 233 tends to turn the disk 230 in the opposite direction to that indicated by the arrows in Figs. 6 and 7. The coupling disk 227 is normally held in its represented raised position by a spring 235. The disk 230 and the toothed wheel 231 are normally coupled to each other by a bolt 238 that extends through the toothed wheel and into the disk 230. On a key *e. g.* $\frac{z}{3}$ being depressed the catch 198 belonging to it hooks itself onto the holding bar 212 which now holds the key down. In its downward movement it presses down the bow 192 and this in turn depresses the constantly revolving coupling disk 227 causing it to engage with one of the teeth of the disk 230 and to set this disk in motion. The pin 236 carries the toothed wheel 231 around also, so that the rack 240 that meshes with the toothed wheel is moved and continues moving until the stop 215 strikes the catch 198 of the depressed key lever. The motion of the rack is accompanied with the sliding of the contact spring 216 against the contact bar 220 and the consequent closure of the transmitting circuit because when a key is depressed it acts on the slanting cross bar 219 and pushes the frame carrying the contact bar over into the position indicated in Fig. 5 by dash and dot lines. When the stop 215 strikes the catch 198 it is pushed back against the action of its spring 200. The depressed lever is then released from the holding bar 212 and the spring 235 lifts the clutch disk 227 together with the bow 192 and the released key into their normal position. On being lifted the clutch disk 227 becomes disengaged from the disk 230 and this disk 230 together with the toothed wheel 231 and the rack 214 are returned into their normal position by the spring 232. The depressed key in rising allows the contact bar 200 to be pulled away from the contact spring 220 by the spring 221. The same action takes place on the depression of any key including the line space key 203 and the word space key 204 but excluding the sign changing key 202. By means of the sign changing key 202 a determined and always equal number of alternations is sent over the line or lines before the rack 214 is moved out of its normal position. To accomplish this an angular striker 237 is attached to the lever of the key 202 which, on the key being depressed, strikes against the horizontal part of the bolt 238 and pushes this bolt (which is normally held up by a flat spring) down causing the upper part of the bolt to sink down out of the plane of the disk 230 thus uncoupling the disk from the toothed wheel and allowing the spring 232 to turn the disk 230 in a clockwise direction until the left end of the semi-circular slot 230^2, Fig. 6, strikes against the pin 236 as shown in Fig.

7, the movement of the pin 236 and the toothed wheel 231 being prevented by the stop 215 of the rack 214 with which the toothed wheel meshes butting against the rack guide 213. At one side of the disk 230 there is a pivoted angular circuit closer 240 with a hinged finger 241 which yields to pressure from its left side but not from its right, so that when the disk 230 brushes against it in turning in a clockwise direction, which happens when the sign changing key is depressed, the circuit closer 240 remains in its normal position. The position of the disk 230 end of the circuit closer 240 after the depression of the sign changing key is shown in Fig. 7. If an ordinary key *e. g.* $\frac{z}{3}$ is now pressed down and the disk 230 is thereby caused to rotate in a counter-clockwise direction through its being coupled to the coupling disk 227 the circuit closer 240 will be forced into contact with the contact spring 242 as indicated by dash and dot lines in Fig. 6. The circuit closer will be kept in this position until the disk 230 has been turned to such an extent that the left end of the slot 230^2, Fig. 7, has reached the pin 236 of the toothed wheel 231 when the finger 241 of the circuit closer will assume the position shown in Fig. 6 and the disk 230 will commence carrying the toothed wheel 231 around with it and causing the rack 214 to move. From the moment the rack 214 commences to move the transmitting circuit is closed in the usual manner by the contact spring 216 brushing against the contact bar 220 the contact previously existing between the circuit closer 240 and the contact spring 242 being broken. By the depression of the sign changing key a number of alternations in addition to the number sent when depressing the key $\frac{z}{3}$ by itself will have been sent over the lines, this additional number corresponding to angular movement determined by the length of the slot 230^2. This will have caused the type-wheel of the receiver to turn special figures into the printing position.

I claim—

1. In a transmitter for a system of electrically recording signs the combination with a source of electric energy adapted to send current impulses, of a plurality of keys each corresponding to a certain number of current impulses and adapted when depressed to close a circuit including said source of electric energy, a continuously rotating member, a locking bar, latches depending from said keys and adapted to engage said locking bar, a releasing member adapted to be moved by said continuously rotating member from initial position into position for engagement with the locked latch of a depressed key and to throw said latch into unlocked position, and means for returning said keys into normal position, adapted to be controlled by said continuously rotating member, substantially as described.

2. In a transmitter for a system of electrically recording signs, the combination with a source of electric energy adapted to send current impulses, of a plurality of keys each corresponding to a certain number of current impulses, a continuously rotating shaft, a disk secured thereto, a releasing member and a contact member loosely mounted on said shaft, said contact member being adapted when moved by a key to close a circuit including said source of electric energy, and said releasing member being adapted when shifted by a key to be coupled to said disk and to be rotated thereby, means adapted to be operated upon depression of said keys to shift said contact member and releasing member, and means for returning said keys into the normal position, adapted to be controlled by said continuously rotating member, substantially as described.

3. In a transmitter for a system of electrically recording signs the combination with a source of electric energy adapted to send current impulses, of a plurality of keys each corresponding to a certain number of current impulses and adapted when depressed to close a circuit including said source of electric energy, means to lock said keys in depressed position, a continuously rotating member, releasing means for said keys adapted to be moved by said continuously rotating member from initial position into position for engagement with the locking means of a depressed key and to release the said key, means operated by said keys to temporarily connect said releasing means to said continuously rotating member, means tending to return said keys into normal position and means tending to disconnect said releasing means from said continuously rotating member and to break the circuit.

4. In a transmitter for a system of electrically recording signs the combination with a source of electric energy adapted to send current impulses, of a plurality of keys each corresponding to a certain number of current impulses and adapted when depressed to close a circuit including said source of electric energy, a continuously rotating member, a locking bar, latches depending from said keys and adapted to engage said locking bar a releasing member adapted to be moved by said continuously rotating member from initial position into position for engagement with the locked latch of a depressed key and to throw said latch into unlocked position, means tending to return said keys into normal position, and means tending to break the circuit

closed by the key and to return said releasing means into normal position.

5. In a transmitter for a system of electrically recording signs, the combination with a source of electric energy adapted to send current impulses, of a plurality of keys each corresponding to a certain number of current impulses, a continuously rotating shaft, a disk secured thereto, a releasing member and a contact member loosely mounted on said shaft, said contact member being adapted when moved by a key to close a circuit including said source of electric energy, and said releasing member being adapted when shifted by a key to be coupled to said disk and to be rotated thereby, means adapted to be operated upon depression of said keys to shift said contact member and releasing member, means tending to return said contact member and releasing member into inoperative position, means to lock said keys in depressed position and adapted to be released by said releasing member, and means tending to return said keys into normal position.

6. In a transmitter for a system of electrically recording signs the combination with a source of electric energy adapted to send current impulses, of a plurality of keys each corresponding to a certain number of current impulses and adapted when depressed to prepare the closing of a circuit including said source of electric energy, means to lock said keys, in depressed position, a continuously rotating member, releasing means for said keys adapted to be moved by said continuously rotating member from initial position to the locking means of a depressed key and to release the said key, means operated by said keys to temporarily connect said releasing means to said continuously rotating member, means operative when said releasing means is connected to said continuously rotating member to complete the circuit inclosing the said source of energy, means tending to return said keys into normal position and means tending to return said releasing means into normal position and to break the circuit.

7. In a transmitter for a system of electrically recording signs, the combination with a source of electric energy adapted to send current impulses, of a plurality of keys each corresponding to a certain number of current impulses and adapted when depressed to close a circuit including said source of electric energy, a shift key, means to lock said keys except the shift key in depressed position, a continuously rotating member, releasing means for said keys adapted to be moved by said continuously rotating member from initial position into releasing engagement with the locking means of a depressed key, means operated by said keys to temporarily connect said releasing means into normal position and to break the circuit, and means operated by said shift key to rotate said releasing means from its initial position a determined amount in a direction opposite to the direction of the rotation of the continuously rotating member.

8. In a transmitter for a system of electrically recording signs, the combination with a source of electric energy adapted to send current impulses, of a plurality of keys each corresponding to a certain number of current impulses and adapted when depressed to close a circuit including said source of electric energy, a shift key, means to lock said keys except the shift key in depressed position, a continuously rotating member, releasing means for said keys adapted to be moved by said continuously rotating member from initial position into releasing engagement with the locking means of a depressed key, means operated by said keys to temporarily connect said releasing means to said continuously rotating member, means tending to return said keys into normal position and means tending to return said releasing means into normal position and to break the circuit, and means operated by said shift key to rotate said releasing means from its initial position a determined amount into a secondary initial position.

9. In a transmitter for a system of electrically recording signs the combination with a source of electric energy adapted to send current impulses, of a plurality of keys each corresponding to a certain number of current impulses and adapted when depressed to close a circuit including said source of electric energy, a shift key, means to lock said keys except the shift key in depressed position, a continuously rotating member, releasing means for said keys adapted to be moved by said continuously rotating member from initial position into position for engagement with the locking means of a depressed key and to release the said key, a main abutment for said releasing means adapted to arrest the same in its initial position, a subsidiary abutment for said releasing means displaced relatively to said main abutment, means operated by said keys to temporarily connect said releasing means to said continuously rotating member, means tending to return said keys into normal position and means tending to return said releasing means into normal position and to break the circuit, and means operated by said shift key to render said main abutment inoperative and to cause said releasing means to connect with said subsidiary abutment.

10. In a transmitter for a system of electrically transmitting and recording signs

the combination with a source of electric energy adapted to send current impulses, of a plurality of keys each corresponding to a certain number of current impulses and adapted when depressed to close a circuit including said source of electric energy, a shift key, means to lock said keys except the shift key in depressed position, a continuously rotating member, releasing means for said keys adapted to be moved by said continuously rotating member from initial position to the locking means of a depressed key and to release the said key, a main abutment for said releasing means adapted to arrest the same in its initial position, a subsidiary abutment for said releasing means displaced relatively to said main abutment, means operated by said keys to temporarily connect said releasing means to said continuously rotating member, means tending to return said keys into normal position and means tending to return said releasing means into normal position and to break the circuit, means operated by said shift key to render said main abutment inoperative and to cause said releasing means to contact with said subsidiary abutment, and a pawl on said releasing means adapted to coöperate with said abutments and to ride over the same when traveling in the direction of the rotation of said continuously rotating member.

PAUL ETIENNE.

Signed in the presence of—
R. LUDERMAN,
A. BRUGGER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."