

(No Model.)

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H. F. STINDE, Dec'd.

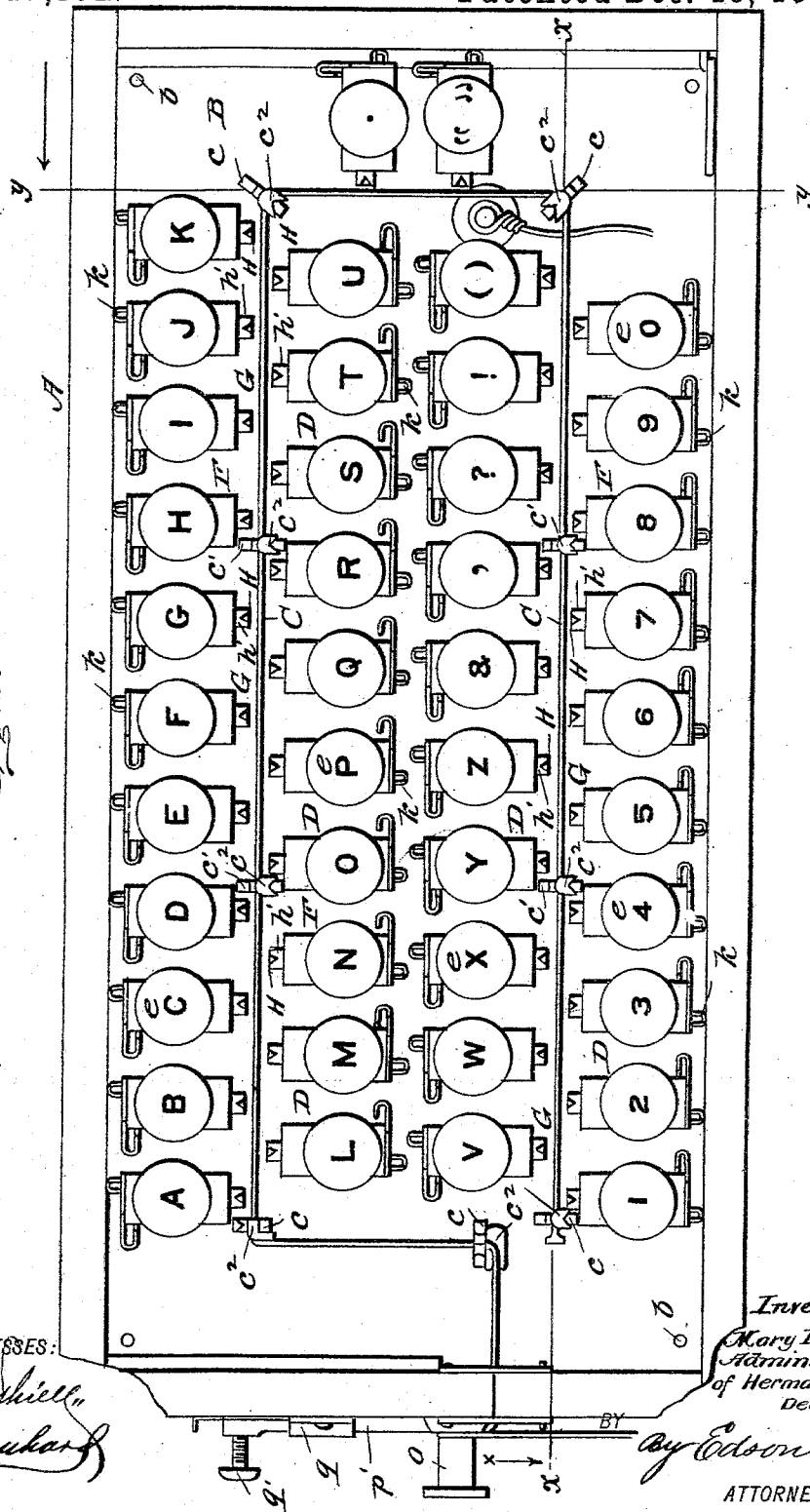
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TELEGRAPHIC TRANSMITTER.

No. 511,172.

Patented Dec. 19, 1893.

Fig. 1.



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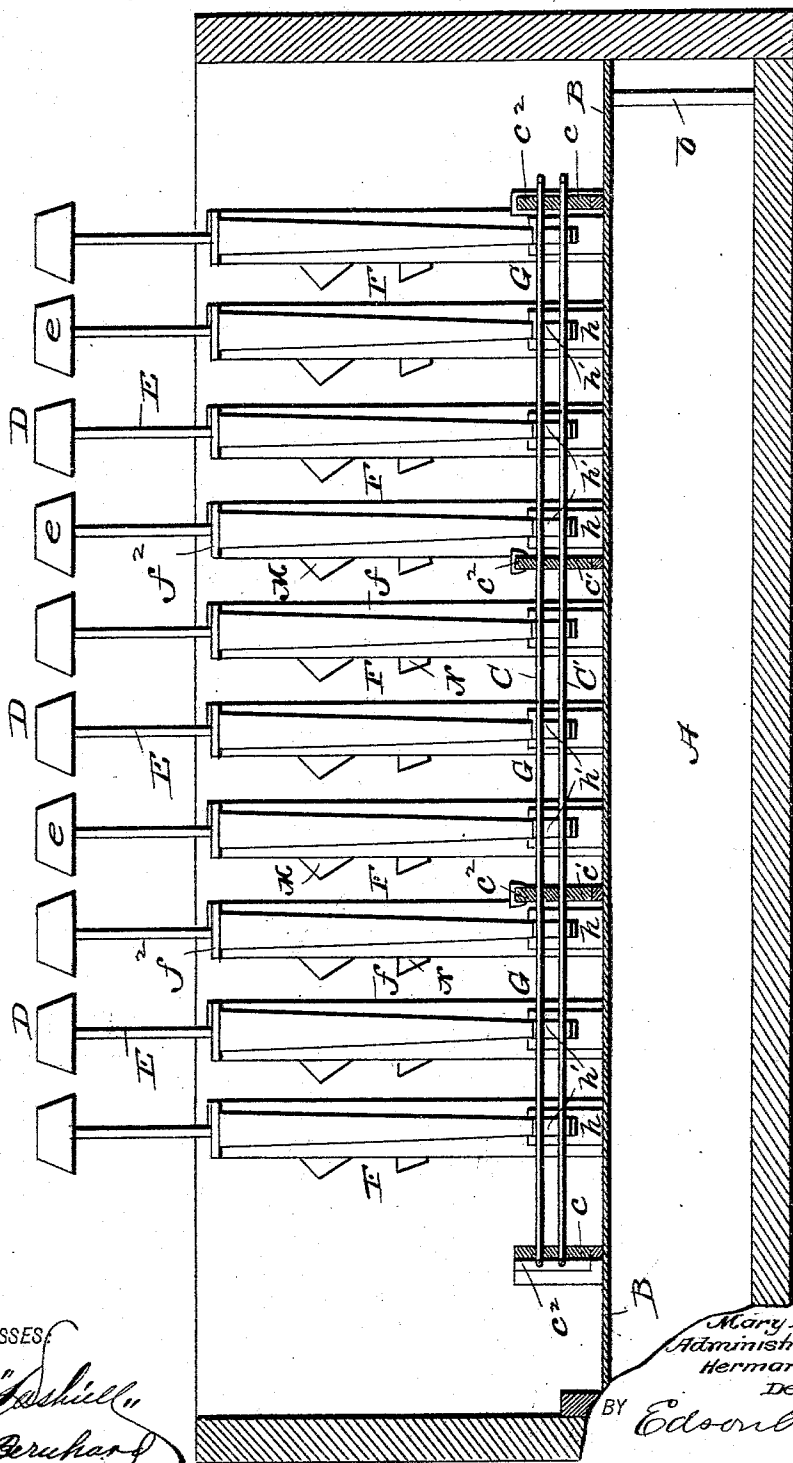
3 Sheets—Sheet 2.

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Fig. 2.



WITNESSES.

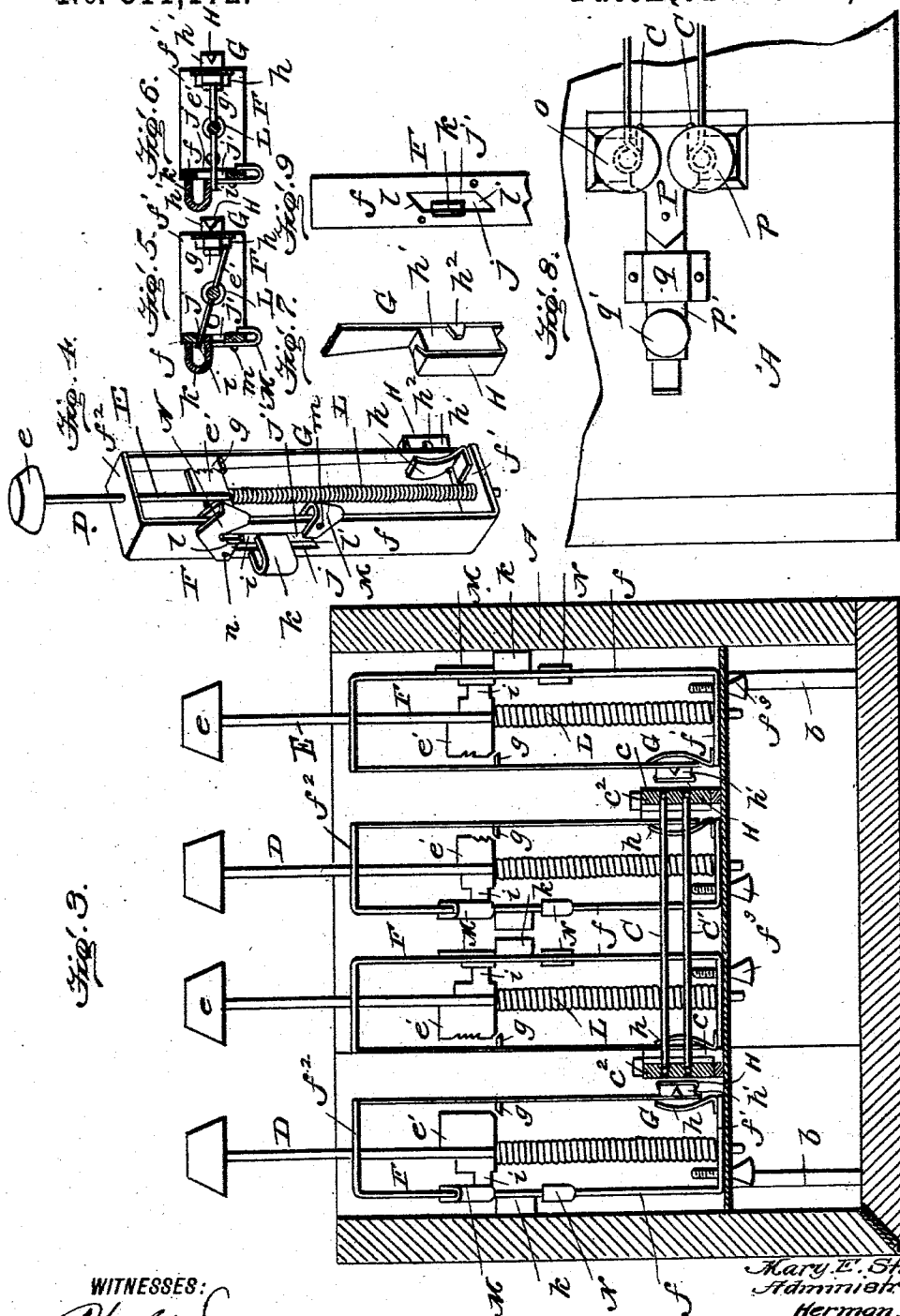
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UNITED STATES PATENT OFFICE.

MARY E. STINDE, OF RED BUD, ILLINOIS, ADMINISTRATRIX OF HERMAN F. STINDE, DECEASED.

TELEGRAPHIC TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 511,172, dated December 19, 1893.

Application filed May 4, 1893. Serial No. 473,012. (No model.)

To all whom it may concern:

Be it known that HERMAN F. STINDE, deceased, late a citizen of the United States, and a resident of Red Bud, in the county of Randolph and State of Illinois, (by MARY E. STINDE, administratrix of the estate of said HERMAN F. STINDE, and a citizen of the United States, residing at Red Bud, county of Randolph, State of Illinois,) did invent certain new and useful Improvements in Telegraphic Transmitters, of which the following is a full, clear, and exact specification of the invention, such as will enable others skilled in the art to which it relates to make and use the same.

The invention relates to a telegraphic transmitter by which Morse and other characters or signals can be sent over an electric circuit with great rapidity and comparative ease on the part of the sending operator who is only required to mechanically depress one of a bank of keys to produce a series of sounds in said circuit forming the Morse or other telegraphic character, which depression of the key is effected at a single operation in a manner similar to the keys of a type writing machine.

A further object of this invention is to effect the automatic return of the key to its initial normal position without disturbing the electric circuit or the make and break devices associated with the key for producing the sounds in said circuit, and a further object is to improve the transmitter in minor details, whereby efficiency of operation is promoted and the construction of the several parts simplified and made readily accessible for purpose of repairs in case of breakage or damage to any of the parts.

With these and such other ends in view as pertain to the invention, it consists in the combination of exposed metallic conductors forming a part of the electric circuit and arranged on insulated supports fixed to a suitable base within an inclosing casing, and a bank of keys arranged around the exposed metallic conductors and each key consisting of an endwise movable rod guided in suitable guides and provided with one or more teeth and a yielding or spring arm forming the circuit breaker of said key, said yielding arm being so arranged that its free end will make

contact with the exposed metallic conductors when the endwise movable rod is depressed to bring its tooth or teeth thereon into engagement with a stud or projection on the yielding arm forming the circuit breaker. The teeth on the endwise movable rod are so arranged, spaced and proportioned that the yielding circuit breaker is pressed into contact with and released from contact with the exposed metallic conductors at the proper intervals of time to produce the sounds forming the Morse or other telegraphic characters; and as the teeth on the different keys are differently constructed to produce the proper signals in the electric circuit, it will be readily seen that the different telegraphic characters can be each produced in the electric circuit by the simple mechanical depression of one key of the bank of keys. After the key has been depressed to produce the desired signal in the electric circuit, it is important that the key shall be returned to its initial position without disturbing its associated circuit breaker or the electric circuit; and to effect this return of the key to its initial position, devices are provided by which the key is mechanically turned on its axis to bring the teeth thereof out of vertical alignment with the stud or projection on the circuit breaker and a coiled spring, which reacts when the finger pressure is removed, to lift the rod and key in a different race way or path from the way in which the key descends so that as the key is lifted its teeth will not strike the stud or projection on the circuit breaker.

The invention further consists in the novel combination of devices, and in the peculiar construction and arrangement of parts, as will be hereinafter more fully described and particularly defined in the claims.

I have illustrated the preferred embodiment of the invention in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a plan view showing the banks of keys. Fig. 2 is a longitudinal sectional view on the plane indicated by the dotted line $x-x$ of Fig. 1, looking in the direction indicated by the arrow X . Fig. 3 is a vertical transverse sectional view on the plane indicated by the dotted line y, y , of Fig. 1. Fig.

4 is a detail perspective view of one of the keys and the parts associated therewith. Fig. 5 is an enlarged detail view showing the position of the endwise movable key-rod after it has been depressed and just prior to commencing its return or up-stroke. Fig. 6 is a like view showing the position of the key rod when near its up-stroke. Fig. 7 is a detail view of the movable contact-plate on the free end of the yielding circuit breaker. Fig. 8 is a detail view of the switch by which the transmitter can be cut out of and thrown into the main circuit.

Like letters of reference denote corresponding parts in all the figures of the drawings.

A is the casing which may be of any suitable form, and within this casing is the base or bed plate B mounted on suitable legs *b*, *b*, which rest on the bottom of the casing. This bed plate B is preferably rectangular in form, although the shape thereof is immaterial; and on the bed plate is erected a series of posts *c*, *c'*, situated near the corners of the base-plate and at suitable distances within the edges thereof to adapt the banks of keys to be arranged on the bed plate, within and around the conductors C, C', the arrangement of the conductors and the banks of keys being such that each key is adapted to have its circuit breaker make contact with the conductors independently of every other key of the whole series. These conductors C, C', are bare metal or exposed wires, and they are secured to the posts *c*, *c'*, in parallel positions, one above the other, but these conductors are insulated from said posts and from each other by the insulating blocks or strips *c*² which are interposed between the conductors and the posts and are recessed or grooved to receive the bare wires which are thus partially embedded in the insulators *c*².

D, D, designate the series of keys which are arranged in several rows or banks, preferably four in number, two of the banks of keys being outside of the exposed conductors and two banks of keys being within the inclosure formed by extending the exposed conductors around the posts near the corners of the bed plate, each key being arranged relative to the exposed parallel conductors so that its contact breaker can make contact with said exposed conductors. By this arrangement of conductors and keys, the number of keys for the alphabet, numerals, punctuation marks, or other characters are compactly disposed within a very limited space, which is very desirable.

Each key D comprises an endwise movable key rod E, a frame F, and a make and break device G. Each key, of the whole series is substantially the same in construction and operation as the other keys of the series, with the sole exception of the arrangement and form of the click-teeth thereon adapted for operation in conjunction with the make and break device G, and a description in detail of the construction and mode of operation

of one of the keys is therefore given. The frame F consists of the upright or standard *f*, a base *f'* and a cap *f*², said base and cap being at right angles to the upright, and parallel with each other, all of the parts of the frame being preferably made or struck up from a single piece of sheet metal although this is not material. The frame is secured to the base in a vertical position by means of the screw or bolt *f*³ which passes through the base *f'* and the bed plate, as shown, and in the base *f'* and the cap *f*² are formed vertically aligned openings through which passes the key rod E and which is free to play vertically in said frame and to be guided thereby in its up and down movements.

The key rod is provided at its upper extremity with the push or finger button *e* which bears the letter or character the key is designed to transmit in the electric circuit, and this rod is provided at a point intermediate of its length with the click-tooth or teeth *e'* which is adapted to contact with a projection on the make and break device G. This make and break device G preferably consists of a flat spring which is attached or fastened at its upper end to the free edge of the cap *f*² of the frame F; and this spring depends in a vertical position from said cap so that its free end is close to the exposed conductors, C, C'. The tension of the spring is exerted to cause its free end to remain away from and out of contact with the exposed conductors, and the recoil of the spring is limited and any clicking noise deadened by means of the yielding or spring stop *h* which is fixed to the base *f'* of the frame F in the path of the lower end of the make and break spring G so that the latter will abut against the spring stop when it recoils away from the exposed conductors. The upper end of the make and break spring being fixed to the cap of the frame, the free end of said spring moves or plays in an arc of a circle when it is forced into contact with and recoils away from the exposed conductors; and to insure the make and break spring having good electrical contact with both of the exposed parallel conductors, the free end of the make and break spring is provided with an oscillating contact plate H which is pivotally connected to the spring and insulated therefrom by an interposed block of insulating material. The plate H is secured at its ends to the insulation block *h'*, and the pivotal connection between the contact plate and the spring G is effected by having lips *h*² on the spring loosely embedded in the sides of the insulating block, although this particular construction is not strictly adhered to, as the plate H can be pivoted to and insulated from the spring G by other devices.

The make and break spring G is provided on one side (the side opposite to the contact plate H) with a stud or projection *g* which is arranged in the path of the tooth or teeth *e'* on the key rod when the latter is depressed; and as the key rod descends the tooth or teeth

e' thereon strike against the stud *g* and cause the spring *G* to vibrate according to the number of the teeth, thus pressing the plate *H* on the free end of the spring into contact with the exposed conductors *C, C'*, whereby the spring *G* and its plate *H* are caused to impinge or strike the conductors the number of times corresponding to the number of teeth and to press against said conductors for such lengths of time according to the width of and the distances between the teeth, and thus disturb the electric circuit to produce therein Morse or other characters. Thus, the key lettered *A* in the first bank in Fig. 1 has the pointed and broad ratchet teeth to produce the Morse character — — — corresponding to the letter *A*; the second key has a broad tooth and three pointed teeth to produce the Morse character — — — corresponding to the letter *B* of the alphabet; the third key has two pointed teeth, an intermediate space, and a third pointed tooth to produce the character — — — corresponding to the letter *C* of the alphabet, and so on throughout the series of keys. It will thus be understood that the simple depression, at one operation, of one of the key rods will vibrate the make and break spring and cause it to have contact with the exposed conductors *C, C'*, to disturb the electric circuit and produce therein the signals corresponding to the Morse characters, or other characters and numerals according to the code of signals adopted; and as each key is independent of the others, a series of keys can be quickly depressed at will by the operator to send a message with accuracy in a very short space of time. Each of the vertically movable key rods is further provided, on the side opposite to the click-teeth *e*, with a guide lug *i* which plays in either of two ways *j, j'*, formed by a longitudinal slot in the upright or standard *f* of the frame, said slot being divided by a partition *k* into the two vertical ways or races *j, j'*. The ends of the slot are inclined or beveled transversely as at *l, l'*, the bevels at the top and bottom extending in the same direction.

The key rod is normally held in its raised position by means of the recoil spring *L* and with its guide lug *i* fits in the way or race *j'*, so that the teeth *e* on the rod are in vertical alignment with the stud *g* on the spring *G*. As the key rod is depressed, the spring *L* is compressed and the guide-lug *i* rides in the race or way *j'* until it strikes the bevel *l'* at the bottom of the way, which bevel serves to turn the key rod axially, thus performing two offices: First, the teeth *e'* on the rod are thrown to one side of the vertical line of the stud *g* on the spring *G* and, second, the guide-lug *i* is adjusted out of line with the race or way *j'* in which the lug moved when the rod was depressed and said lug is thereby brought into line with the other way or race *j*. As the finger is removed from the button on the key rod, the recoil of the spring *L* lifts the rod and causes the lug *i* thereon to ride in

the race or way *j* and the teeth *e'* thereon clear the projection *g*, or move to one side of the projection *g*, so that the teeth *e'* on the rod do not act on the spring *G* when the rod is raised. When the rod is near the completion of its upstroke, the lug *i* rides on the bevel or incline *l* at the upper end of the ways or races *j, j'*, and as the spring continues to press against the key-rod, the lug *i* riding against the bevel *l* serves to turn the rod axially in the reverse direction so that the rod is restored to its initial position, with its lug *i* in the upper end of the race *j'* and with its teeth *e'* in vertical alignment with the lug *g* on the spring *G* to strike the latter when the rod is again depressed.

To prevent the key rod from turning in the reverse direction when it is twisted axially by the bevel or incline *l'* at the completion of its down stroke, an automatic latch *M*, is provided, which is pivoted at *m* to the upright or standard *f* of the frame *F*; and one end of this latch is arranged in the path of the guide lug in the race *j'* while its square or abrupt edge terminates at a suitable distance from the way *j* to enable the lug *i* to fit between one side of the way *j* and said square end of the latch when the key rod is depressed. The other end of the latch is made heavy enough to overbalance the end of the latch in the path of the lug *i* on the key rod. As the key rod and lug *i* thereon descend in the race *j'*, the lug *i* strikes the free end of the latch which moves on its pivot to permit the lug *i* to ride on the bevel *l'* and come into line with the other race *j*; and at this time, the heavy end of the latch drops to bring its square end opposite the lug *i* and thus the latch acts automatically to prevent the lug *i* from riding in the way or race *j'* when the key rod completes its down stroke. There is also provided a similar latch *N* at the upper end of the race or way *j* which is pivoted at *n* to the standard or upright *f* and has its free end arranged over the way or race *j* so that as the key rod and lug *i* are raised by the spring *L* the latch gives to the lug *i* near the upstroke of the key rod and prevents the lug *i* from taking into the race *j* when the key rod is raised to its initial position. Two automatic latches *M, N*, are thus provided situated at opposite ends of the ways or races *j, j'*, to prevent the key rod from having any axial movement except those imparted to the rod by the lug *i* riding on the bevels *l, l'*, at the opposite ends of the races.

Each end of the exposed conductors *C, C'*, protrudes beyond one of the walls of the casing *A* and they are connected to binding posts *o, p*, to which the wires of the main circuit are also connected; and with these protruding ends of the exposed conductors and the wires of the main circuit contacts a metallic connector plate *P* on a slide-switch *q* which is made of insulating material. This slide switch is preferably guided in a keeper *q* fixed to the casing *A*, and the switch has a

knob q' by which it can be conveniently moved or adjusted by hand.

It is evident that the switch can be moved toward the approximate ends of the conductors and the main line wires so that its plate P is in contact therewith electrically and thereby the conductors C, C', are cut out of the main circuit; but to put the transmitter into the main circuit, it is only necessary to withdraw the slide so that its plate P is out of electrical connection with the conductors C, C', and the main line wires.

The operation of my invention may be briefly described as follows: The keys or characters forming the words of the message are depressed one after another in a manner similar to operating a type writing machine, and each key is depressed at a single operation instead of a series of movements varying in number from two to fifteen as required with the ordinary telegraph key. As each key rod is pushed down, its click-teeth e' ride against the stud g on the make and break spring G to vibrate the latter in accordance with the number and arrangement of click teeth on the key-rod, thus bringing the contact plate H on the spring G into electrical contact with the exposed conductors C, C', to disturb the electrical circuit and produce therein the Morse or other characters corresponding to the letter, numeral or other character on the key rod. As the key rod completes its downstroke, the guide lug i thereon impinges against the latch M and rides on the bevel or cam l' to turn the key rod on its axis and throw the click teeth e' thereon out of line with the stud g on the spring G, and at the same time bring the guide lug i in the way or race j ; and when the finger pressure is removed, the spring L reacts to lift the key rod so that the lug i rides in the way or race j until it strikes the latch N and rides on the bevel or cam L, which operates to turn the key rod axially and restore it to its initial position by the time the key rod is lifted to its highest point.

The key rods can be quickly depressed one after the other to transmit the proper signals in the electric circuit, and by this instrument messages can be accurately sent by an operator as fast as the most cultivated ear can receive the messages.

Changes in the form and proportion of parts and details of construction of the mechanisms herein shown and described as an embodiment of the invention can be made without departing from the spirit or sacrificing the advantages of the invention, and the right to make such modifications and alterations as fairly fall within the scope of the invention is therefore reserved.

What is claimed as new is—

1. In a telegraph transmitter, the combination of a series of keys each having a movable key-rod provided with click-teeth and a vibrating make and break device which is actuated by the click teeth on said rod, and the exposed conductors common to all the

keys of the series and arranged in such proximity to the make and break devices that the latter are adapted to contact directly with said conductors as each make and break device is actuated by the click-teeth on its proper key rod, substantially as and for the purposes described.

2. In a telegraph transmitter, the combination of a series of keys each having an endwise movable rod provided with click-teeth, a frame in which the key-rod is guided and constructed to turn the key-rod axially at the completion of its strokes when depressed and raised, a make and break spring for each key rod which is supported on said frame in position for its stud to be struck by the click-teeth as said key-rod is depressed, and the exposed continuous conductors common to all the keys of the series and arranged in the path of each make and break spring to enable the latter to have direct contact with said conductors, substantially as described.

3. In a telegraph transmitter, the combination with a suitable bed, of a series of key-rods each guided in a suitable frame on said bed and provided with click-teeth, a series of make and break springs each supported by one of said frames and having a free vibrating portion and a stud which lies in the path of the click teeth on the key-rod, and the exposed conductors common to all of the keys of the series and fixed to insulated supports on the bed in such proximity to the free ends of all the make and break springs that each spring is adapted to contact directly therewith as said spring is actuated by the click-teeth on the proper key-rod, substantially as described.

4. In a telegraphic transmitter, the combination with a suitable casing, of the exposed conductors, C, C', arranged within the casing and each having one end protruding from said casing and connected with suitable connectors for the main line circuit, a switch slide guided in a keeper on the casing and provided with a metallic plate adapted to contact with the exposed conductors and the connectors for the main line circuit, and a series of keys each provided with a make and break device arranged to make contact with the exposed conductors within the casing, substantially as described.

5. In a telegraphic transmitter, the combination of the exposed metallic conductors C, C', and a series of keys each comprising an endwise movable rod guided within a suitable support and provided with the click teeth e' , a make and break spring carried by said support and having a lug arranged in the path of said click teeth, and mechanism for imparting axial movement to said key rod at the completion of its down and up strokes, whereby the rod is returned to its initial position without coming in contact with the make and break spring, substantially as set forth.

6. In a telegraph transmitter, the combina-

tion of the conductors, a series of stationary frames in close juxtaposition to said conductors and each provided with slots forming the independent races or ways and the inclines at the terminals of said slots, a key rod guided for reciprocating movement in each frame and provided with the click teeth and with the guide-lug that moves in said races, said guide lug riding on the bevel at one end of the race as it descends to turn the key rod axially in one direction and likewise riding, on its return stroke, on the other incline to turn the key rod axially and return it to its initial position, and a make and break spring supported by the frame in position to contact with the conductors and provided with the stud that lies in the path of the click teeth to be vibrated thereby as the key rod descends, substantially as described.

7. In a telegraphic transmitter, the combination with the exposed conductors, of a series of stationary frames each having the independent races or ways and the bevels or cam surfaces at the ends of said races, a key rod guided in each frame and provided with the guide lug adapted to ride against said bevels to turn the rod axially near the completion of its down and up stroke, an automatic latch arranged in the path of the guide lug on said key rod to prevent the latter from having reverse axial movement on its stroke, and a make and break device adapted to contact with the exposed conductors and arranged to be vibrated by the key rod on its down stroke only, substantially as and for the purpose described.

8. In a telegraphic transmitter, the combination with the exposed conductors, of a series of stationary frames each having the longitudinal races or ways and the inclines or cam surfaces, the key rod guided in each frame and having the guide-lug that rides in said races on the down and up stroke of the rod and which impinges against the bevels to impart axial movement to said rod, the independent automatic latches pivoted to the frame near the opposite bevels or cam surfaces and each arranged in line with the races or ways to be struck by the guide lug on the key rod as the latter completes its down and

up strokes, and a make and break device arranged to be vibrated by the key rod on its down stroke and adapted to contact with the exposed conductors, substantially as and for the purpose described.

9. In a telegraphic transmitter, the combination of the exposed metallic conductors, the series of reciprocating key rods each coacting with a vibrating make and break device which contacts with said conductors, and a stationary frame in which each key rod is guided and which frame is provided with mechanism for imparting axial motion to said key rod as it reciprocates therein and with automatic latches by which the key-rod is prevented, at its down and up stroke respectively, from turning into its former guide-way, substantially as described.

10. In a telegraph transmitter, the combination of a series of fixed frames each provided with a reciprocating rod, the exposed metallic conductors common to all of the keys and arranged in close juxtaposition thereto, the vibrating spring supported by each of the fixed frames and provided with means in the path of the key rod to be actuated thereby as it is depressed and the oscillating contact plate pivotally connected to the free end of said vibrating spring, but insulated from electrical connection therewith, and arranged to make direct contact with said exposed metallic conductors, substantially as and for the purposes described.

11. In a telegraphic transmitter, the combination of the exposed conductors, the series of fixed frames each having a yielding limit-stop near said conductors, a key-rod guided in each frame, and a spring supported by the frame in the path of the key rod and with its free end adapted to impinge against the spring stop as it moves away from the exposed conductors, substantially as described.

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

MARY E. STINDE,

Administratrix of the estate of the late Herman F. Stinde, deceased.

Witnesses:

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GEORGE BOUCHER.