

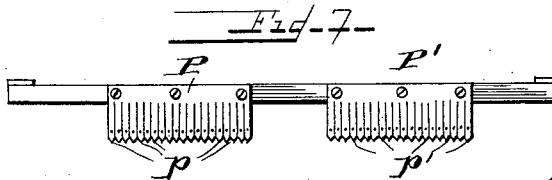
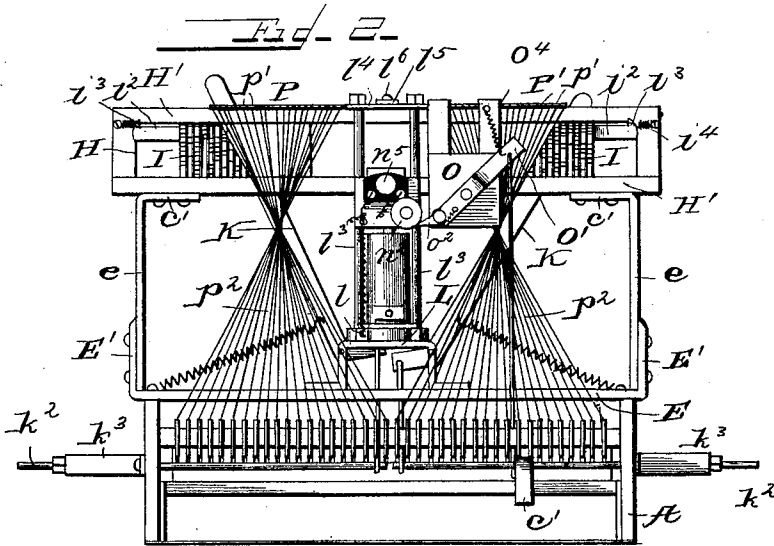
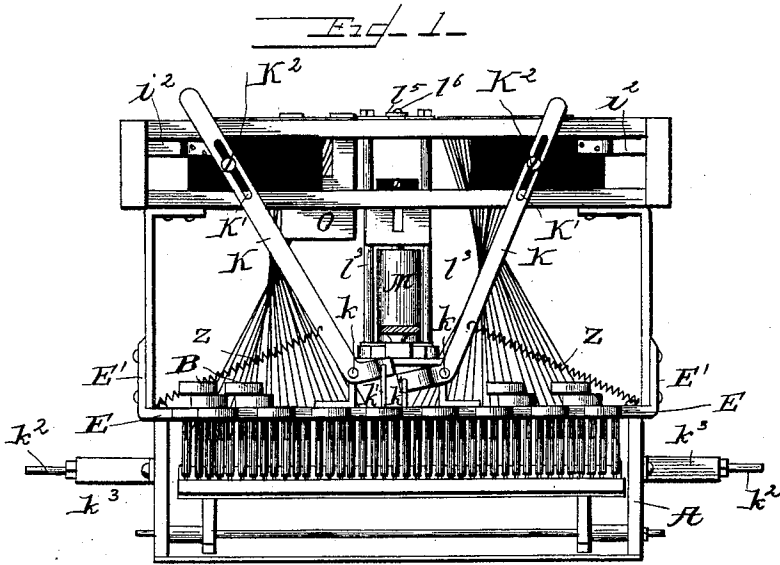
(No Model.)

2 Sheets—Sheet 1.

C. WILLOUGHBY.
TELEGRAPH TRANSMITTER.

No. 480,644.

Patented Aug. 9, 1892.



Witnesses

J. W. Faubuschniott
E. Clarkson

Inventor

Charles Willoughby
By Edwin S. Clarkson
his Attorney

(No Model.)

2 Sheets—Sheet 2.

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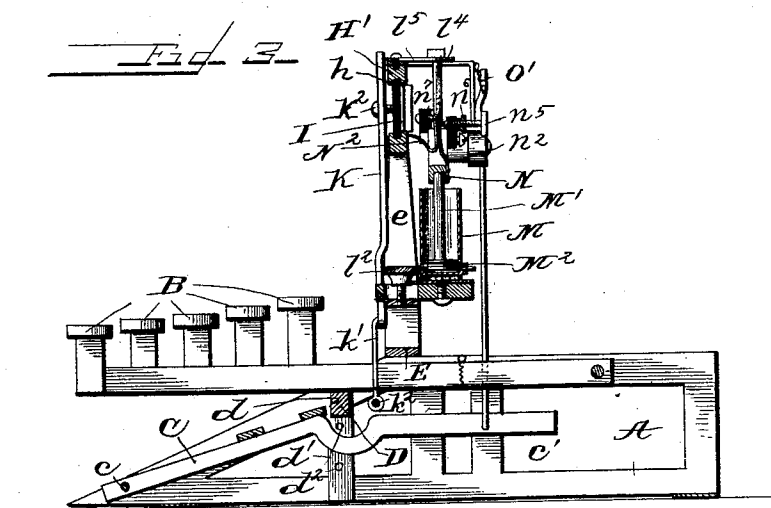
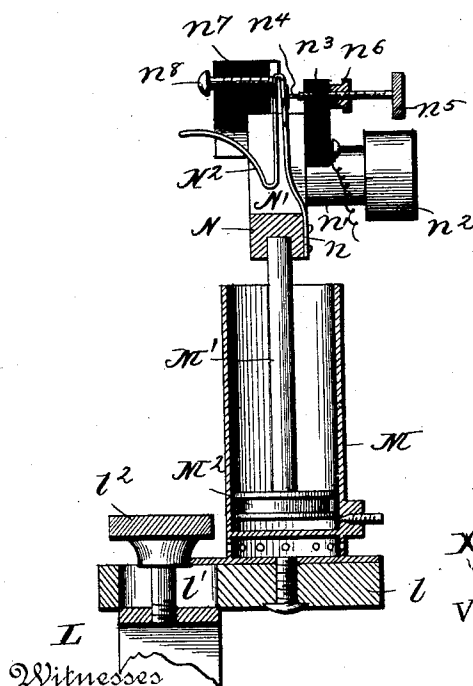


Fig. 4



Witnesses

G. A. Taubenschmitt.
E. Clarkson

Fig. 5

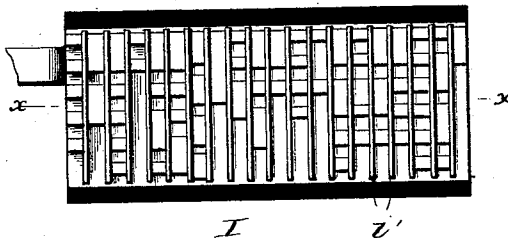
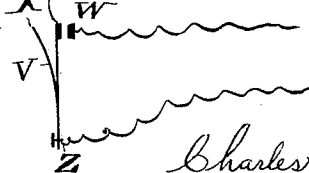


Fig. 6



Fig. 7



Inventor

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UNITED STATES PATENT OFFICE.

CHARLES WILLOUGHBY, OF SAN FRANCISCO, CALIFORNIA.

TELEGRAPH-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 480,644, dated August 9, 1892.

Application filed June 30, 1891. Serial No. 398,056. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WILLOUGHBY, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Telegraph-Transmitters; 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 telegraph-transmitters; and it consists of a bank of keys, one for each letter or character desired, and other mechanism to be hereinafter pointed out and claimed.

The object of my invention is to construct a transmitter having a bank of keys by means of which the Morse or other telegraph alphabet and characters can be transmitted over the wires by the pressure of keys corresponding to each letter similarly arranged to a typewriter, thus attaining a higher rate of speed, perfect letters, and with much less labor than the old system of a key, which requires a number of movements for each character. The pressure of one key is sufficient to make any letter or character used, whereas where made by the key now in general use from two to fifteen movements are necessary to make one character.

In connection with the bank of keys I use a pair of sliding plates provided with raised surfaces representing the characters or signals to be transmitted, with partitions between each letter to hold said plates in position until the carriage has descended over the letter, these plates to be moved into position by a lever under the key-bars and stopped at the proper place by a set of stops connected with each letter-bar and so arranged that the depression of a letter will cause the stop to move in the way of the plate, thus stopping it at the desired point. A carriage carrying electric attachments so arranged that the depression of a point will make a signal to correspond with the length of time the point is depressed. This point is to be depressed by the raised surfaces of the sliding character-plates, and the carriage to be raised by a lever under the letter-bars and provided with a

device by means of which the carriage after attaining the proper height will be released by a slip-catch and descend under the action of a spring, the descent to be retarded by an air-chamber, from which the escape of air can be regulated; so as to allow it to descend slow or fast. If the signals are to be read by sound at the receiving-office, they will necessarily be slow; but if they are to be taken off on tape by an automatic receiver they may be very rapid; and with these ends in view my invention consists of the parts and combination of parts, as will be more fully described, and pointed out in the claims.

In the drawings, Figure 1 is a front elevation of the transmitter. Fig. 2 is a rear elevation of the same. Fig. 3 is a central longitudinal section. Fig. 4 is an enlarged detail sectional view. Fig. 5 is an enlarged view of the character-plate. Fig. 6 is a section of the same on the line *xx*, Fig. 5; and Fig. 7 is a top plan view of the spring-stops.

A represents the lower frame of the transmitter, having a bank of keys B similar to a typewriter.

C is a frame extending across the machine immediately underneath the letter-bars B and works on a center at *c*, said frame being provided with a rearwardly-extending arm *c'*, so that the depression of any letter-bar will depress this arm.

D is a flat bar extending across the frame A, and is provided with upwardly-extending arms *d*, between which the type-bar levers work. The bar D is secured to an upright piece *d'*, which is provided with a series of holes *d''*, by means of which the bar D may be adjusted higher or lower, thereby allowing the key levers or bars B a longer movement.

E is a flat piece of metal extended across the frame A and has turned-up ends *E'* *E'*. Secured to these ends *E'* are two posts *e* *e*, the upper ends *e'* *e'* of which are bent at right angles.

H is a frame secured to the posts *e*, and the sides *H'* *H'* of said frame are each provided with a groove *h*, in which slide character-plates I. These plates are each provided with characters of the telegraph-alphabet, and between said characters partitions *i'* are secured for the purpose hereinafter referred to. On the

rear of the plates I are secured arms i^2 , having a lug i^3 at their outer extremities, and springs i^4 connect said arms i^2 to the frame H.

K K are levers having a slot K' near their upper ends, in which works a pin K^2 , said pin K^2 being secured to the rear of the character-plates.

Z are springs for retaining the levers K in a normal position. The lower ends of the levers K are bent at right angles and are pivoted at k . Pivoted to these ends k are links k' . (See Fig. 3.)

k^2 are rods the inner ends of which hang in the links k' and the outer ends of which are secured in brackets k^3 . These rods k^2 lie immediately under the letter-bars B, and are adapted to be depressed by the finger-bars when they are operated. Connected to these bars k^2 are links k' , which are connected to the lower ends of the respective levers K K, said levers being attached to the respective character-plates I. Thus it will readily be seen that when a letter-bar is pressed down it comes in contact with one of the bars k^2 and forces it downward, carrying with it the link k' , and thus throwing one of the levers K, with the character-plate I, toward the center of the machine.

L is a plate $\square$ -shaped, and it is secured in a suitable manner to the plate E, or it may be cast integral with the same. The said plate L has two lugs ll cast on it, as shown. Between the lugs ll is a plate L' , having a slot l' in its forward end. A thumb-screw l^2 is secured in the slot l' and engages a screw-threaded hole in the plate L, thereby adapting the plate L to be adjustable backward and forward.

l^3 are posts secured in the plate L, and are connected together at the top by means of a cross-piece l^4 .

l^5 is a plate extending from the top of the frame H, and is provided with a slot, through which works a set-screw l^6 , thus connecting the plate l^5 , which connects the post l^3 to the plate l^5 .

M is a cylinder secured to the plate L and provided with a regulating-valve for the purposes hereinafter described.

M' is a piston having the head M^2 , working in the cylinder M.

N is a block with grooved sides, which slide up and down on post l^3 . The piston-rod M' is connected to this block N.

N' is a slot cut entirely through the block N, and working in the same is a spring N^2 , which is secured to the block at n .

n' is a roller loosely mounted on the block N, and is provided with a rim n^2 .

n^3 is an insulated plate, through which works the contact-point n^4 , which is screw-threaded and provided with a head n^5 .

n^6 is a jam-nut working on the contact-point.

n^7 is another insulated plate secured to the block N, and is provided with a contact-point n^8 .

The plate O is attached to the frame H' of the machine, so as to bring it on a plane with

roller n^2 on the block N. O' is a lever suitably pivoted. A rod p^2 is attached to said lever at one end, while its other end is secured to the rearwardly-extending arm c' . O² is a slip-catch on one end of lever O', which is brought to its normal position by means of spring o^3 , said slip-catch being arranged to catch under roller n^2 and raise it to the proper height under the pressure of the arm c' . The catch on end of lever O' allows said lever (after performing its duty of raising block N to its proper height) to pass over roller n^2 and return to its normal position under the pull of spring G. The roller n^2 is mounted on block N simply for the purpose of allowing lever O' to raise said block without friction.

The number of spring-fingers p and p' correspond with the number of characters on the character-plates and number of letter-bars in the bank of keys, and are attached to the top cross-piece H', in which the character-plates slide, (one plate on each side,) in such a manner that the slight depression of any spring-finger will cause it (one of the spring-fingers) to move in the way of a projection on the character-plate and stop it at the proper place. Each finger-stop is connected by wire or other material with a corresponding letter-bar and stop, the character-plate at the letter corresponding to the letter on the letter-bar.

The operation is as follows: By pressing one of the letter-bars B it comes in contact with the rod k^2 , to which is connected one of the levers I by link k' , thus moving the character-plate K^2 in position in the center of the frame H. The spring stops or fingers p or p' are also by this movement pulled down by means of the wire p^2 being attached to the letter bars B. Thus the character-plate is held in the proper position by this stop, there being one stop for each character. At the same time the letter-bar B also strikes the pivoted frame C, thereby depressing the rearwardly-extending arm c' , which by means of the rod p^2 pulls one end of the lever O' down and forces the slip-catch against the loose roller n^2 , thereby raising the block N, which carries the contact-spring N^2 and piston M' up into place just back of the character-plate I. When the character-plate is brought to the proper place, the block N is disconnected by the slip-catch leaving the roller n^2 , and descends by means of a spring connected to the block N and plate L, thus pulling the spring N^2 over the character representing the desired letter. The character-plate is held in position by means of the spring-stops p or p' and the partitions i' , the contact-spring N^2 working between said partitions. Of course it is understood that the contact-spring N^2 is raised and in position before the character-plate is in its proper position under said contact-spring, thus obviating any interference with the contact-spring N^2 and the small partitions i' when the character-plate is sliding into proper position. The air-chamber is provided with a trap, which lets the air in as the piston

ascends; but as the piston descends the pressure of air offers resistance to the downward movement of the block N, causing it to go at a speed which makes the characters easily

readable by ear.

In Fig. 8 I show the electrical connections which are attached to block N. V is a Y-shaped piece of spring steel or other metal attached firmly to block N at points X. W is an insulated point of contact attached to block N, to which one line is connected. Y is the point of contact on V. The depression of point X causes point of contact Y to move over against point W, thus closing the circuit, the length of which depends on the pressure at point X. The point X is depressed by the block N descending (under the action of the spring from block N to plate L) and passing over character-plate. The Y-shaped piece V is attached to the block N in such a manner that when there is no pressure against X the points Y and W will remain apart. As each depression of point X causes a signal to go to line, as many raised points as there are on the character-plate in any one letter that many signals will go to the line, and the length of signals will correspond to the breadth of the point, and each letter or character will be made from the depression of any letter-bar as the block N is released and descends under the action of the spring.

It is evident that many slight changes and alterations may be made in the relative construction and arrangement of parts without departing from the spirit of my invention, and hence I would have it understood that I do not confine myself strictly to the parts herein described.

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

1. The combination, with a transmitter of the character described, of the spring-stops p

and p' and means for connecting said stops, respectively, to the respective letter-bars, substantially as and for the purpose specified.

2. In a transmitter, substantially as herein described, the combination, with character-plates adapted to move horizontally and levers pivoted to said plates, of spring-stops p and p' , said levers and spring-stops adapted to be operated by the finger-bars B, substantially as and for the purposes specified.

3. In a transmitter, substantially as herein described, having horizontally-sliding character-plates, an adjustable reciprocating block or carriage, and a contact-spring located in said block, said spring adapted to engage the character-plates, substantially as and for the purpose specified.

4. In a transmitter, substantially as herein described, the combination, with an adjustable reciprocating block or carriage having a contact-spring and points n^3 and n^4 and a roller loosely mounted thereon, of a cylinder and piston and means for reciprocating said carriage, said piston being connected with the block or carriage, substantially as and for the purposes specified.

5. In a transmitter, substantially as herein described, the combination, with an adjustable block or carriage having a contact-spring and loosely-mounted roller and a piston connected with said block or carriage, of a lever pivoted to the frame of the transmitter and provided with a slip-catch and connected with a lever immediately below and operated by the letter or finger bars B, substantially as and for the purposes specified.

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

CHARLES WILLOUGHBY.

Witnesses:

SAML. K. DYER,
WM. J. KIRKWOOD.