

H. P. CLAUSEN.
 IMPULSE TRANSMITTING DEVICE OR SENDER.
 APPLICATION FILED OCT. 26, 1916.

1,254,658.

Patented Jan. 29, 1918.

Fig. 1.

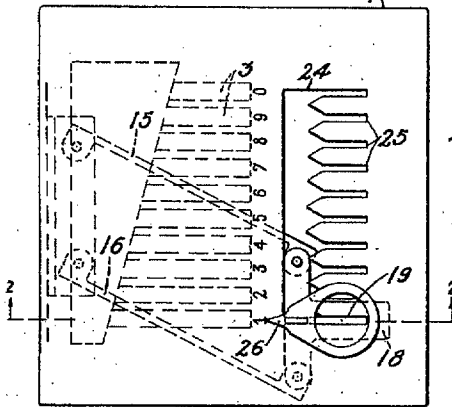


Fig. 2.

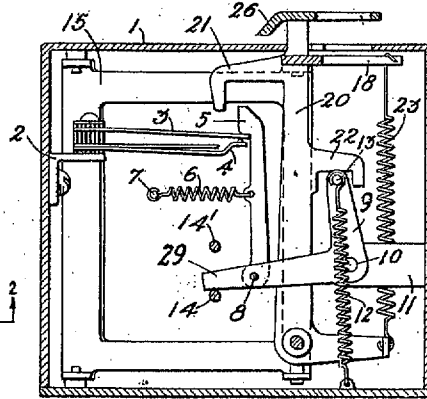


Fig. 3.

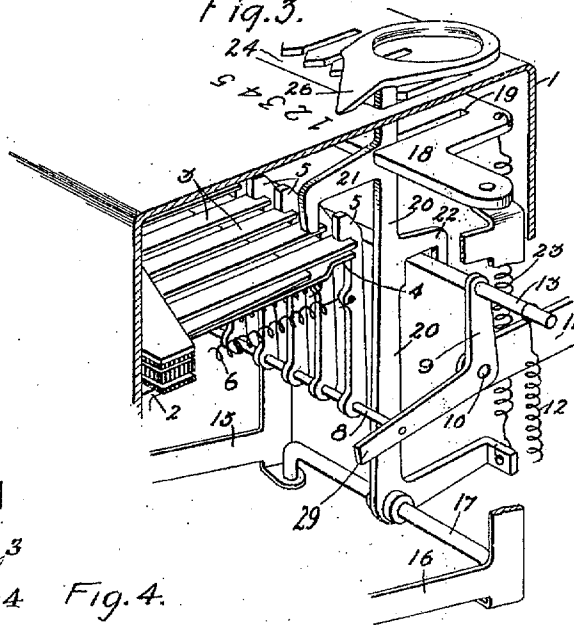
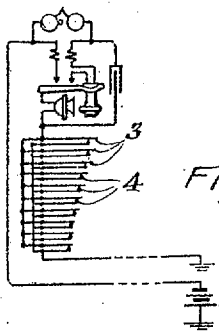


Fig. 4.



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UNITED STATES PATENT OFFICE.

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IMPULSE-TRANSMITTING DEVICE OR SENDER.

1,254,658.

Specification of Letters Patent.

Patented Jan. 29, 1918.

Application filed October 28, 1916. Serial No. 127,928.

To all whom it may concern:

Be it known that I, HENRY P. CLAUSEN, a citizen of the United States, residing at Mount Vernon, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Impulse-Transmitting Devices or Senders, of which the following is a full, clear, concise and exact description.

10 This invention relates to impulse transmitting devices or senders, and more particularly it relates to senders for controlling selectively operable switching devices employed in automatic and semi-automatic telephone systems.

15 The main object of this invention is to provide a sender of the type which directly controls the operation of the switching devices by impulses of varying frequencies.

20 Another object is to provide a sender arranged to send out impulses in accordance with a certain numerical designation, and in which the interval of time required for transmitting impulses to designate one numeral or character is the same as the time required for sending impulses to designate any other numeral or character.

25 In order to attain the above defined objects, according to the principal feature of this invention, the impulse transmitting device is provided with a plurality of vibrating members for sending impulses of varying frequencies.

30 The above mentioned feature, together with others, will be more clearly pointed out in the ensuing description and claims.

35 In the drawings illustrating this invention, Figure 1 is a plan view of a sender embodying the features of this invention; Fig. 2 is a sectional view of the device taken on the line 2-2 of Fig. 1; Fig. 3 is a perspective view of a portion of the sender with parts broken away to more clearly show the structure and Fig. 4 shows a circuit for a subscriber's substation which is provided with a sender embodying the features of this invention.

40 Referring to the drawings, 1 represents a casing for inclosing the mechanism employed in the sender. A plurality of tuned vi-

brating members 3 and a plurality of stationary contact springs 4 are insulatively mounted on a support 2 attached to the casing. Each vibrating member is tuned to a 55 different frequency of vibration and is so arranged that when it is vibrating, it alternately engages and disengages a contact spring 4. The free ends of the vibrating members 3 and the free ends of the contact 60 springs 4 control break points in a circuit (shown in Fig. 4), so that whenever a vibrating member is in engagement with a contact spring, the controlling circuit is closed. Each vibrating member is normally 65 held in engagement with its associate contact spring 4 by means of a catch 5, which is actuated by the spiral spring 6. Each of the catches 5 has a curved surface, so arranged as to engage the associated spring 70 in a manner hereinafter described. Each catch 5 is rotatably mounted on a rod 8, fastened to a bell crank lever 9. This bell crank lever is pivoted at 10 to an extension 11 of the casing, and is normally held 75 against stop 14 by a spring 12 attached to rod 13. A stop 14 is also provided for a purpose hereinafter described. Another bell crank lever (not shown), similarly mounted for carrying rods 13 and 8, is provided at 80 the other side of the vibrating members.

Brackets 15 and 16 are pivotally supported to swing horizontally in a frame. A rod 17 and a bar 18 are pivotally secured to the brackets 15 and 16, and operate to space 85 the brackets apart. The rod 17 also serves as an axis about which a finger lever 20 oscillates. The finger lever extends through a slot 19 in the bar 18 and an opening 24 in the top of the casing. L-shaped projections 21 and 22 extend from opposite sides of the finger lever 20, for a purpose which will be hereinafter described.

90 A plurality of characters, corresponding to the different characters used in designating subscribers' numbers, are placed along one edge of the opening 24. Opposite each character a slot is provided into which the lever 20 can be pulled. A pointer 26, attached to the finger lever 20, indicates the 100 position in which the lever 20 should be operated to transmit impulses of a frequency

corresponding to that of the indicated character. The lever is normally held out of the slots by a spring 23.

The operation of the mechanism above described is as follows: The operator moves the finger lever to a position opposite the slot of the character corresponding to the digit of the desired number, and then pulls the lever into this slot. By moving the finger lever to the desired position, the brackets 15 and 16 are oscillated about their respective pivots. The lower end of lever 20 moves in an arc of a circle, but since the lever is rotatably mounted on rod 17, the top of said lever is kept in engagement with the straight edge of the opening 24 by the spring 23.

When the finger lever is pulled into the desired slot, the finger lever engages rod 13, causing the bell crank lever 9, by which said rod is carried, to be rotated upon its pivot 10 until it engages the stop 14'. The bell crank lever is held in this position by the spring 12. This spring 12 is arranged so that when the sender is not in use, its line of action is to the left of the pivot 10 as viewed in Fig. 2, and holds the bell crank lever against stop 14. When the lever is moved into a slot, the line of action of spring 12 is changed to the right of the pivot so that the spring holds the bell crank lever against stop 14'.

As the bell crank lever is being rotated to this last mentioned position, the rod 8 carried thereby is moved upward, causing the catches 5 to be moved upward also. The free ends of the vibrating members are normally held downward under a vertical tension, as hereinafter described, so that this movement of the catches allows the vibrating members to move upward sufficiently to move out of engagement with their associated contact springs, but the catches are not moved upward far enough to move out of engagement with the contact springs to allow them to start vibrating. By opening these circuits, the controlling circuit is broken.

At this same time the projection 21 engages a catch 5 to pull it out of engagement with the vibrating member associated with the slot to allow the member to start vibrating. The vibrating reed intermittently opens and closes the controlling circuit to send impulses of the frequency to which it is tuned.

When the operator releases the finger lever, spring 23 causes this lever to be drawn out of the slot. As the lever moves out of the slot, the catch 5, which was held out of engagement with member 3 by projection 21, is rotated about rod 8 by its associated spring 6 to bring it into engagement with its associated vibrating member 3. At this time the arm 29 of the bell crank lever 9 is in its upper position. Therefore, as the catch 5

is rotated, the vibrating member 3 engages the curved surface of that catch and is pushed downward.

The projection 22 of finger lever 20, on moving to the left, engages the rod 13 and causes the bell crank lever 9 to be rotated counter-clockwise until it engages the stop 14. This movement of the lever causes all of the catches 5 to be moved downward and to pull all the free ends of the vibrating members downward into engagement with their respective contacts. This places the vibrating members under a vertical tension so that when they are released, they will start vibrating. The apparatus is now in its normal position, but the finger lever 20 which has no normal position, remains in the position opposite the character of the last digit used until again moved by the operator.

What is claimed is:

1. In an impulse transmitting device, a plurality of vibrating members, each member being arranged to transmit impulses of a different frequency of vibration, means for normally holding said members under tension, and a single means common to said plurality of vibrating members for selecting a member and for operating said first mentioned means to start said selected member vibrating.
2. In an impulse transmitting device, a plurality of vibrating members, means for normally maintaining said members under tension, and means for operating said first mentioned means to start a selected member vibrating.
3. In an impulse transmitting device, a plurality of vibrating members, a plurality of contact springs, means for normally holding said members in engagement with said contact springs, and an adjustable finger lever for controlling said means to release any desired contact spring.
4. In an impulse transmitting device, a plurality of vibrating members, a plurality of contact springs, a plurality of catches, each catch being associated with a vibrating member to normally hold it in engagement with its associated contact spring, and an adjustable finger lever for selectively operating said catches.
5. In an impulse transmitting device, a plurality of vibrating members, a plurality of contact springs, each contact spring being associated with a vibrating member, a plurality of catches, each catch being associated with a vibrating member to normally hold it in engagement with its associated contact spring, a rotatable member, and a finger lever associated with said rotatable member for controlling said catches.
6. In an impulse transmitting device, a plurality of vibrating members, a plurality of contact springs respectively associated therewith, a plurality of catches, each catch

being associated with a vibrating member to normally hold it in engagement with a contact spring, and a finger lever arranged for movement to operate any one of said catches to withdraw it from engagement with its associated members, and at the same time to allow the remaining vibrating members to move out of engagement with their respective contact springs.

In witness whereof, I hereunto subscribe my name this 11th day of October, A. D. 1916.

HENRY P. CLAUSEN.