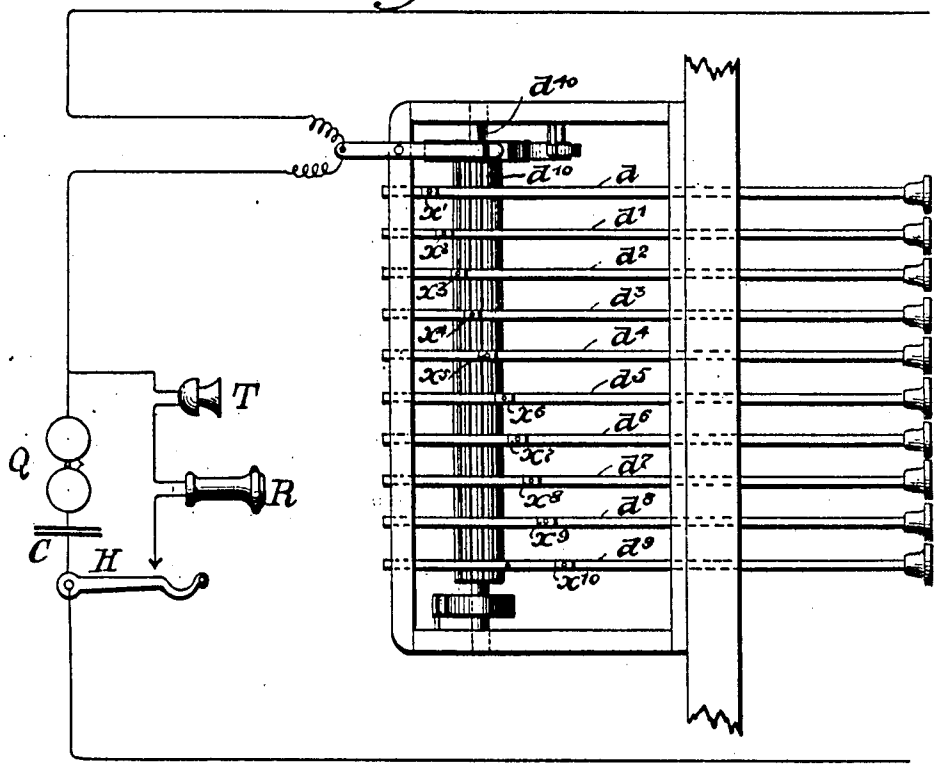
E. E. CLEMENT.

IMPULSE TRANSMITTER.

APPLICATION FILED AUG. 23, 1906.

1,037,172. Patented Aug. 27, 1912.

Fig. 1.



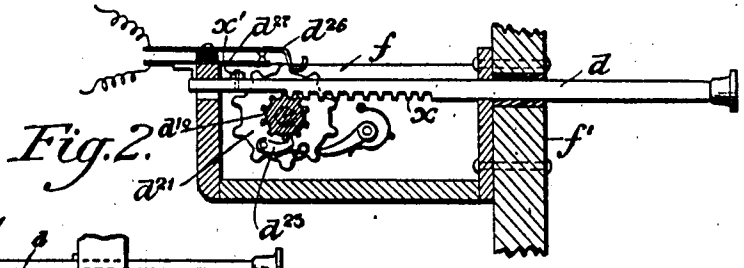


Fig. 2.

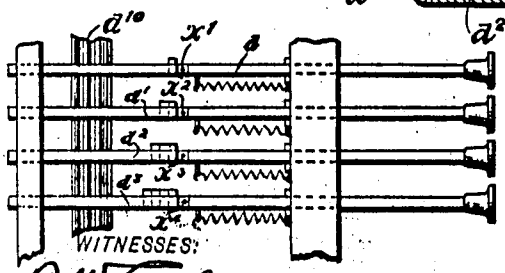


Fig. 3.

WITNESSES:

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IMPULSE-TRANSMITTER.

1,037,172. Specification of Letters Patent. Patented Aug. 27, 1912.

Application filed August 23, 1906. Serial No. 331,807.

To all whom it may concern:

Be it known that I, EDWARD E. CLEMENT, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Impulse-Transmitters, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to impulse transmitters and especially to the type used for the purpose of sending impulses over a line for signaling purposes or to effect switches at a central office in automatic and semi-automatic telephone systems.

This application contains much matter originally disclosed in a copending application filed by me April 15, 1905, and bearing the Serial Number 255,831.

The object of the present invention is to provide a conveniently operated instrument which will be certain in operation and which will have its parts minimized in number.

Other objects of the invention will be apparent to those skilled in the art when the following description is read in connection with the drawings which form a part of this application and in which—Figure 1 is a diagram of a subscriber's telephone station equipped with the invention. Fig. 2 is a detail view. Fig. 3 is a plan view of a modification.

Referring to Fig. 1, I have therein shown the usual transmitter T, receiver R, hook H, ringer Q, and condenser C. In addition to these, the apparatus consists of the following: a main shaft d^{40} carries the gear wheel d^{10}, which may conveniently be one long gear. The teeth of this wheel are engaged by the teeth ϖ, on the push button racks $d, d', d^2, d^3, d^4, d^5, d^6, d^7, d^8$ and d^9. These buttons are provided with stops $\varpi', \varpi^2, \varpi^3, \varpi^4, \varpi^5, \varpi^6, \varpi^7, \varpi^8, \varpi^9$ and ϖ^{10}, set at successively greater distances in relation to the push buttons. The first rack when pushed in is limited in its movement by the stop ϖ'; the second rack d' is allowed to pass farther in but is also limited in its movement by the stop ϖ^2. The succeeding racks d^2, d^3, etc., have progressively increasing travel to their stopping points and all of the racks when depressed cause their teeth to engage the teeth of the wheel d^{10} causing the latter and its connected shaft d^{40} to turn. When the first push button is thus depressed it causes the shaft to rotate but a short distance while the last button causes it to make nearly a complete revolution. On the shaft is mounted a number wheel d^{21} whose pawl d^{23} engages the wheel d^{10}. When any button is depressed and the shaft rotates this number wheel is not affected, but when the shaft is released the number wheel turns with the shaft and the teeth engage its contact spring d^{20} which then makes and breaks with the contact spring d^{27}. It should be observed that the number wheel always turns in the same direction, and that the distance each button and its connected rack may be pushed in is measured in multiples the wheel one tooth, the rack d' two teeth, of the wheel. In short, the rack d moves the wheel one tooth, the rack d' two teeth, and so on. The same result might be attained by providing the rack d with one tooth, the rack d' with two teeth, the rack d^2 with three teeth, etc., the stops ϖ^1, ϖ^2, ϖ^3, etc., being then all arranged in a straight row as shown in Fig. 3, or in any other desired position indifferently.

It is thought the operation of the device will be sufficiently clear from the foregoing description.

Here the shaft d^{40} is mounted in a frame f secured at the front to the telephone box or operator's table f'. The figure is a transverse section, and the springs d^{26} and d^{27} are shown mounted on the back of the frame, while the push rack d has its stem mounted to slide in a long bearing in the frame. The stop ϖ' in this case is mounted on the stem and moves with it instead of being fixed. These details can of course be varied almost indefinitely without departing from the scope of the invention, which comprises as its broadest feature the idea of having a single pair of contacts made and broken by a wheel which always moves in the same direction, impelled by a spring S which is wound up by setting devices manually controlled and acting against an obstruction to limit the movement in setting.

I desire particularly to state that while I have shown the springs d^{26} and d^{27} as normally together and controlling a metallic circuit, they may be normally open and included in any circuit.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. An impulse transmitter for sending

variable signals comprising a common shaft or spindle with a motor spring and controlling device, and a plurality of actuating devices, each adapted to turn the shaft a different determinate distance, a signal wheel carried by the shaft, and contacts made and broken by said wheel a number of times determined by the particular distance through which the shaft has been turned, substantially as described.

2. A variable signal impulse transmitter comprising the following instrumentalities: a toothed wheel and a pair of contact springs acted upon thereby when turning, means for causing said wheel to turn always in the same direction, driving means for the wheel, setting means adapted when actuated to store up energy for driving and stops positioned at intervals on the setting means in order of numerical progression, and each adapted according to its position to determine the distance through which the wheel will turn, substantially as described.

3. An impulse transmitter comprising a driven member having an unchanging direction of progression, a driving member therefor, setting means for the driving member, a fixed stop for the setting means determining an absolute zero position thereof, and movable selective stop mechanism carried by the setting means and coöperating with the fixed stop, whereby the actuation of the setting means will store up energy for driving and simultaneously determine the extent of movement of the driven member.

4. An impulse transmitter comprising a single number wheel, a shaft and a spring therefor, and a plurality of selective means for turning the shaft through different angular distances, substantially as described.

5. An impulse transmitter comprising a toothed wheel, contact springs for the wheel, and a set of push buttons adapted to turn the wheel through different angular distances, substantially as described.

6. An impulse transmitter comprising a single number wheel, a common shaft and a spring therefor, a plurality of selective devices for turning the shaft through different distances, and an operative connection between the shaft and the number wheel.

7. An impulse transmitter comprising a single number wheel, a plurality of selective devices, a shaft common to all of said devices and adapted to be turned thereby through different distances, a spring for returning said shaft to normal and a connection between the shaft and the number wheel which operates in the retrograde movement of the shaft.

8. An impulse transmitter comprising a single number wheel, a plurality of selective devices, a shaft common to all of said devices and adapted to be turned thereby through different distances, means for returning said shaft to normal, an operative connection between the shaft and number wheel, and means to prevent the operation of the number wheel in the operation of said devices.

9. A variable signal impulse transmitter comprising a common shaft or spindle carrying a motor spring, a toothed signal wheel mounted on said shaft, actuating racks each adapted to turn the shaft a different determinate distance, and means to limit the drive of each rack thereby producing a different number of impulses.

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

EDWARD E. CLEMENT.

Witnesses:
G. E. RUFF,
JOS. L. WRIGHT.