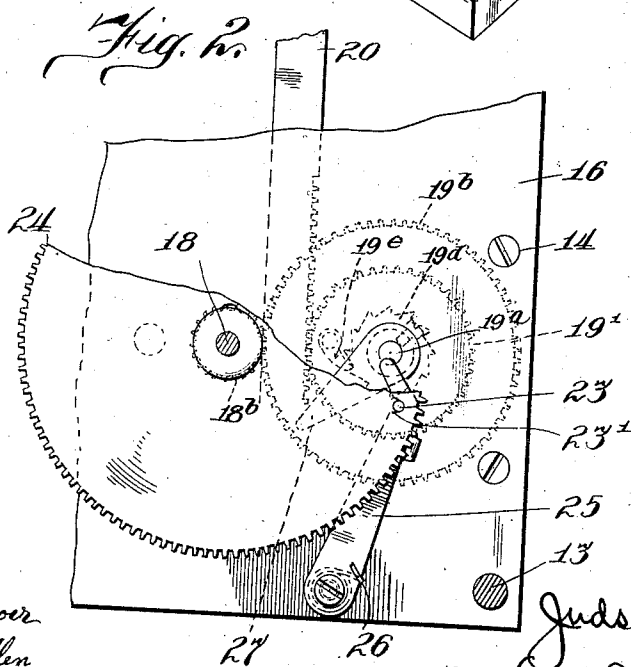
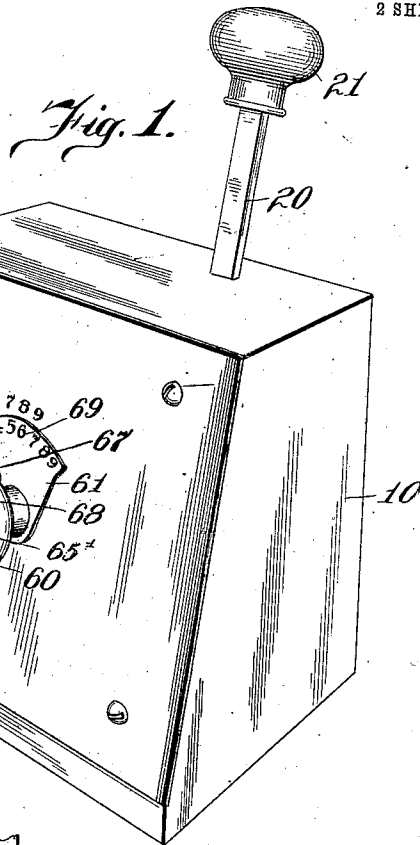


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ELECTRICAL SIGNAL TRANSMITTER.
APPLICATION FILED APR. 19, 1910.

1,044,218.

Patented Nov. 12, 1912.

2 SHEETS—SHEET 1.



Witnesses
Hilton Lenoir
W. Linn Allen

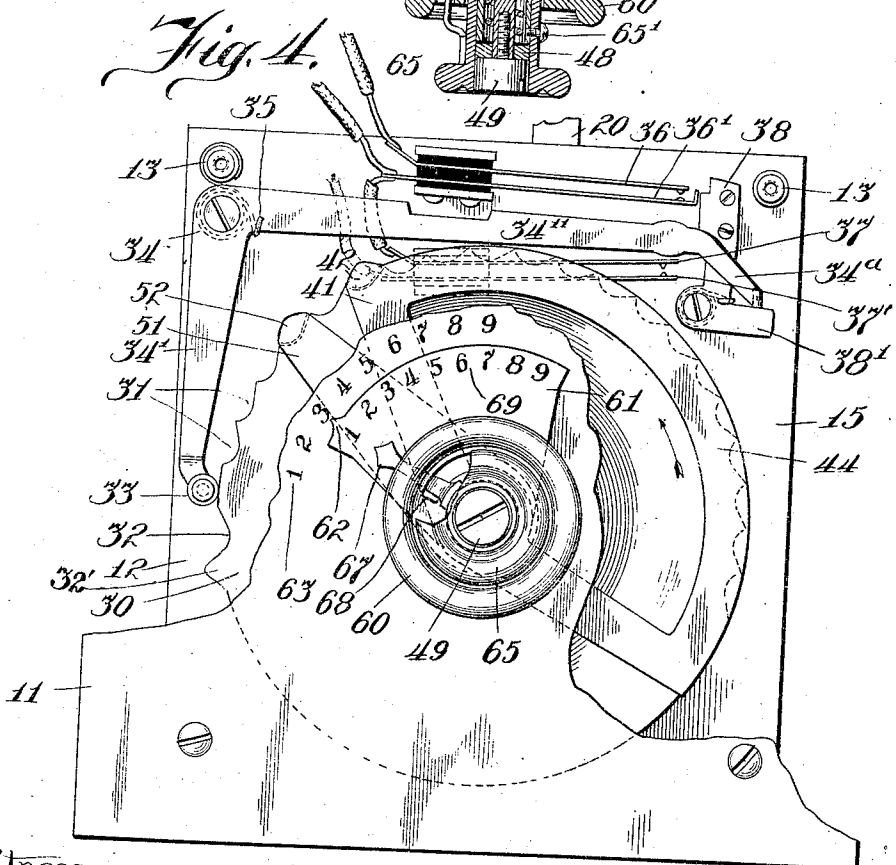
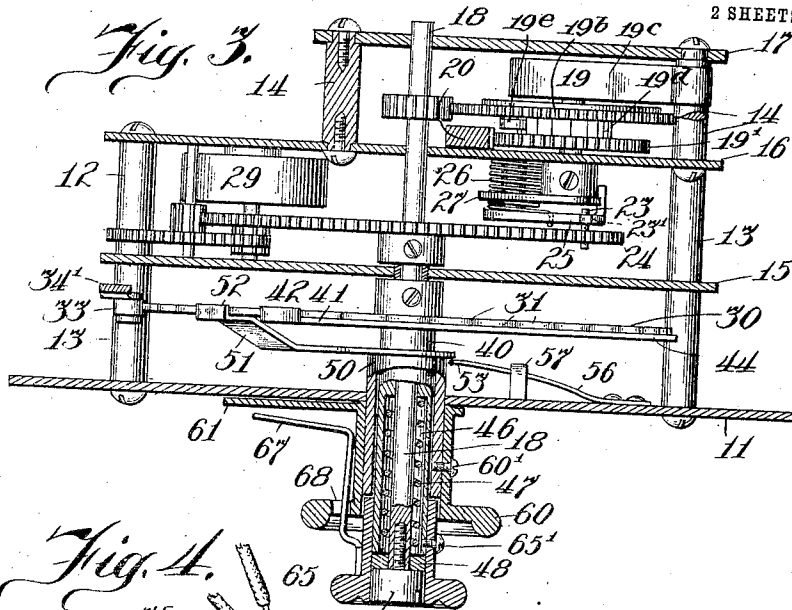
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UNITED STATES PATENT OFFICE.

JUDSON McFELL, OF CHICAGO, ILLINOIS.

ELECTRICAL SIGNAL-TRANSMITTER.

1,044,218.

Specification of Letters Patent.

Patented Nov. 12, 1912.

Application filed April 19, 1910. Serial No. 556,404.

To all whom it may concern:

Be it known that I, JUDSON McFELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electrical Signal-Transmitters, of which the following is a specification.

My invention relates to improvements in electrical signal transmitters, and has for its general object to provide a simple, efficient, easily operable, and durable device for the transmission of a code or number signals over an electric line.

One of the salient objects of my invention is to provide a device whereby any desired number within the range of the instrument may be transmitted in such a way that the impulse groups, constituting the digits of a number, are separated by intervals of predetermined and uniform duration.

A further object is to provide a construction in which the variable signaling is all done by one impulse wheel and appropriate circuit breakers.

Another object is to provide an improved setting arrangement, whereby the apparatus may be quickly and easily set to transmit any desired signal within its range, and further objects to provide an apparatus which will retain its adjustment to send the set signal through any number of operations, and until the setting is intentionally changed.

Many other and further objects will become apparent to those skilled in the art from the following description taken in conjunction with the accompanying drawings, in which—

Figure 1 is a perspective of a transmitter built in accordance with my invention; Fig. 2 is an enlarged detail of part of the motor mechanism; Fig. 3 is a plan view, with parts in section, of the motor and setting mechanism; and Fig. 4 is a front elevation with parts broken away.

In the drawings, 10 indicates in general a casing, having a face plate, 11, on which is mounted the frame work, 12, shown as comprising corner posts, 13, and extension posts, 14, supporting in parallel relation three

frame plates 15, 16, and 17. A main shaft, 18, extending approximately centrally through the entire frame is arranged to be driven by a suitable spring motor, 19, housed between the plates 16 and 17, and conventionally shown as embodying the usual winding arbor 19^a, bearing the loose gear 19^b, and acted upon by spring 19^c, gear 19^b meshing with a pinion 18^b on the shaft 18, and receiving its motion from the arbor 19^a through a ratchet 19^d, fast on arbor 19^a and the conventional pawl 19^e, carried by gear 19^b. The motor is adapted to be wound by a depressible rack bar, 20, extending out through the top of the casing and provided with a suitable handle, 21, the normal position of the motor parts being determined by engagement of a pin, 23, upon a large gear wheel, 24, carried by shaft, 18, with a notch, 23', in a detent lever, 25, pressed by spring, 26, into normal position for engagement in the pin, and arranged to be moved to releasing position by an arm, 27, rotatable with the winding gear, 19', of the motor 19. The arrangement of the parts is such that when the ratchet bar is depressed, it winds the motor turning the arbor 19^a just far enough to cause arm 27 to throw the detent arm 25 out of the path of the pin 23, so freeing the large gear wheel, 24, and the main shaft 18 with which it rotates, for one complete free rotation. The running down of the motor throws the arm 27 back to normal position, permitting the detent arm, 25, to move forward under the pressure of its spring to position again to receive the pin 23, thereby to stop the motor after exactly one rotation of the main shaft. For timing of the main motor parts, the large gear, 24, may be connected with any suitable governor mechanism.

In the space between the plates, 11 and 15, the main shaft carries in fixed relation thereto, an impulse or signal wheel, 30, preferably of large diameter, and provided peripherally with a series of notches, 31, of any suitable number, preferably arranged in regular and continuing sequence throughout an appropriate proportion of the circumference of the wheel. For some purposes, also, it may be desirable to have arbi-

trary notches, as the notch, 32, following the regular sequence of signal notches, and a tooth or teeth 32'. Bearing upon the periphery of the wheel, 30, is a roller, 33, of a bell crank lever, 34, acted upon by a spring, 35, which tends constantly to press the roller-bearing arm 34', of the bell crank, toward the center of the wheel so that each time a notch 31 passes roller 33, arm 34' moves inward and arm 34'' moves upward. The long arm 34'' of the bell crank is arranged in rising to its highest position to close a pair of switch springs, 36—36', lifting the lower spring, 36', to such extent that said contact spring may be latched in raised or circuit closing position by a spring pressed detent, 38, of bell-crank shape, the short arm of said detent, indicated at 38', being overlain by a nose, 34^a, of arm 34'' of operating lever 34. Whenever the roller 33 rides to the top of a crest between two wheel notches 31, arm 34'' of operating lever 34 is depressed and near the lower limit of its throw said arm 34'' strikes the short arm 38' of the detent, tilting the latter, so that it releases contact spring 36', permitting the latter to spring to normal position, so as to open the switch. Thus it will be apparent that the detent structure holds the switch 36—36' closed for a period of time appreciably longer than would be the case if the direct action of lever arm 34'' upon switch spring 36' alone were depended upon for the maintenance of the switch 36—36' in closed condition. The arm, 34'', when depressed may close the grounding switch, 37—37', one leaf of which is connected, as shown, to one of the springs, 36—36', and the other leaf being grounded. It will, therefore, be apparent that in the rotation of the notched wheel every time a notch, 31, passes the roller, 33, the switch 36 is closed, and is latched in closed position until the roller is moved out by the crest between the adjacent notches, and the nose, 34^a, is thereby occasioned to release the detent, 38, from locking engagement with the spring, 36. The locking arrangement enables the switch to be held closed positively until the roller is almost on the crest between notches, and then the switch opens sharply as the detent is withdrawn.

For varying the number signal transmitted by the wheel, I provide a plurality of shiftable devices, each of which may close one or more notches on the periphery of the wheel, immediately following the number of notches which it is desired to operate to cause the transmission of a number-signal digit, and such spacers, as I will term them, I arrange to be set from the outside of the casing, preferably by an arrangement of a plurality of concentric sleeves, each

connected to a spacer. Specifically, 40 indicates a sleeve, surrounding the shaft, 18, projecting through the casing, and within the casing carrying an arm, 41, provided with a spacer, 42, at its end, said spacer adapted neatly to fill one of the notches 31 in wheel 30, with its outer surface either to lie flush with the surface of the wheel, or, as herein shown, to extend therebeyond in a crest, which, in passing roller 33, will cause bell crank 34 to close the ground switch, 37.

If desired, the arm 41 may have an arcuate extension, 44, for covering all the notches in rear thereof, or if it is desired that the number signal transmitted shall be followed by an arbitrary series of impulses, the arc 44 is omitted. The sleeve, 40, extends beyond the front plate, 11 of the casing, and is counterbored, as at 46, to receive a coiled spring, 47, which at its inner end bears against the bottom of the counterbore, and at its outer end bears against a washer, 48, held in place by a screw, 49, taking into the center of the shaft, 18, so that the spring tends constantly to maintain the sleeve and arc, 41, in innermost position. A second sleeve, 50, overlies the first said sleeve, and is provided with an arm, 51, carrying a spacer, 52, in arrangement similar to the parts 41 and 42. The outer sleeve 46 has a hub flange, 53, which, when the sleeve is in its innermost position, is just out of contact with the spring, 56, secured to the front plate 11, and provided with a limitation stirrup, 57. The outer sleeve, 50, is provided with a handle, 60, secured thereto by screw 60', and carrying a sector plate, 61, provided with an index point, 62, arranged to sweep over a dial, 63, upon the face plate 11, so that the point, 62, indicates by reference to figures on the dial 63, the number of notches left exposed between the normal position of roller, 33, or the point at which it ordinarily dwells, and the spacer, 52. The inner sleeve, 40, is provided with a pointer, 67, projecting through an arcuate slot, 68, in the handle, 60, and having its points properly related to the dial, 69, upon the sector plate, 61, of sleeve 50, so that its relation to the numbers upon said plate indicate the number of free notches between the spacer 42 and the spacer 52.

To set the apparatus to send a determinate number signal, say 31, the parts are positioned as shown in Fig. 4, with the pointer, 62, pointing to the figure 3 on the dial 63, and with pointer, 67, indicating figure 1 on dial 69. When the parts are in this position with the spacers 42, and 52 engaging the wheel 30, as shown in Fig. 3, rotation imparted to the wheel, in the direction of the arrow (Fig. 4) causes three free notches; 31,

to pass the roller, 33, thereby to operate the signaling switch, 36—36', three times, then spacer, 52, passes by the roller; then one notch passes the roller, and then follows
 5 spacer 42 and the arc 44 (if the latter be provided) to prevent the roller from working into more notches until the final notch 32 is reached, when one arbitrary impulse will be sent if the electrical system in which
 10 the device is used requires such operation.

To set any other signal, the handle 60 is axially retracted, carrying with it the handle, 65, so as to disengage both of the spacers, 52 and 42, laterally from the notches of the
 15 wheel, the handle, 60, is rotated until its indicating point 62 designates the appropriate number upon the dial 63 to constitute the tens digit of the number signal to be sent, and then the handle 60 is released and
 20 the springs, 47 and 56, force the handle inward, carrying spacer 52 into the appropriate notch of the wheel 30. Next, the handle 65 is retracted, withdrawing the spacer, 42 from the wheel, but not affecting
 25 the spacer, 52; as the outer sleeve is held against retraction under such circumstances by the spring 56; then the handle 65 is turned until its pointer 67 indicates the desired units number upon the dial 69, and
 30 then, upon release of the handle, 65, the spring 47 forces the sleeve 40 inward and causes the spacer 42 to engage the appropriate notch of the wheel 30.

Obviously, by increasing the number of
 35 sleeves, spacers, and indicating dials, the device may be adapted for sending numbers of more than two digits.

While I have herein described in some detail an embodiment of my invention which
 40 I have found to be practical and useful, it will be apparent to those skilled in the art that many changes might be made in the embodiment of my invention without departure from its spirit and within the scope
 45 of the appended claims.

What I claim is:

1. In a device of the character described, a notched signaling wheel, a shaft therefor, a plurality of notch-filling spacers therefor
 50 each said spacer being fixed in its radial distance from the wheel center, and movable rotatively relative to the wheel and transversely of the plane of the wheel into or out of a notch thereof.

2. In a device of the character described, a notched signaling wheel, a shaft therefor, and a spacer member mounted on said shaft movable axially and rotatively on the shaft and having an offset end portion to interfit
 60 in and close a selected notch in the wheel.

3. In a device of the character described, a notched signaling wheel, a shaft therefor, a plurality of sleeves on the shaft movable

axially and rotatably on the shaft, and spacer members carried by said sleeves, adjustable by movement of said sleeves to engage desired notches in the wheel at will.

4. In a device of the character described, the combination of a switch, a rotatable signal wheel, a shaft therefor, shaft-driving
 70 means, a plurality of concentric sleeves on said shaft movable axially and rotatably thereon, and means carried by said sleeves movable axially to engage or disengage the wheel, and rotatably to effect variation of
 75 the signaling contour of said wheel.

5. In a device of the character described, a notched signal wheel, mechanism for rotating said signaling wheel arranged to stop in a predetermined position, a plurality of
 80 spacers for closing selective notches in the wheel, means for moving said spacers axially and rotatively of the wheel to select and close said notches, and indicating means connected with the moving means for visually
 85 indicating the position of the spacers.

6. In a device of the character described, the combination of a casing, a switch, a signaling wheel, a shaft therefor, within the casing, means for rotatably driving said
 90 shaft, concentric sleeves upon said shaft extending to the exterior of the casing, means carried by said respective sleeves, and movable therewith to affect the effective signaling contour of the wheel, said sleeves extending to the exterior of the casing and being
 95 movable axially and rotatively relative to the shaft and indicating means, associated with said sleeves, for indicating the effective exposure of said signal wheel.

7. In a device of the character described, a frame, motor mechanism carried by the frame, including a shaft, a notched signaling wheel upon said shaft, a switch associated with the wheel, a plurality of concentric
 105 sleeves independently mounted upon said shaft and extending beyond the frame and movable axially and rotatively relative to the shaft, spacer members carried respectively by said sleeves, and movable therewith to engage and close selective notches in the wheel, and means associated with said sleeve for indicating the number and relation of notches effectively exposed upon the wheel.

8. In a device of the character described, the combination of a frame, a motor in the frame, means for winding the motor, means for stopping the motor in predetermined position, arranged to be tripped by the winding means, a notched signal wheel, a shaft for said wheel driven by the motor, and projecting through the frame, a plurality of concentric sleeves mounted upon said shaft for axial and rotary movements thereon, and
 125 spacers carried by said sleeves movable

thereby to position to close desired notches of the wheel.

9. In a device of the character described, the combination of a frame, a motor therein, a notched signal wheel driven thereby, means adjustable on the wheel for closing desired notches to vary the signal-setting, a switch, means for locking the switch in one position, and means, operable by the notched portion

of said wheel, controlling the switch and the locking device.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

JUDSON McFELL.

In the presence of—

MARY F. ALLEN,

W. LINN ALLEN.

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