A. A. CLOKEY.

CALL BOX.

APPLICATION FILED JUNE 23, 1915.

1,164,069.

Patented Dec. 14, 1915.

Fig 1.

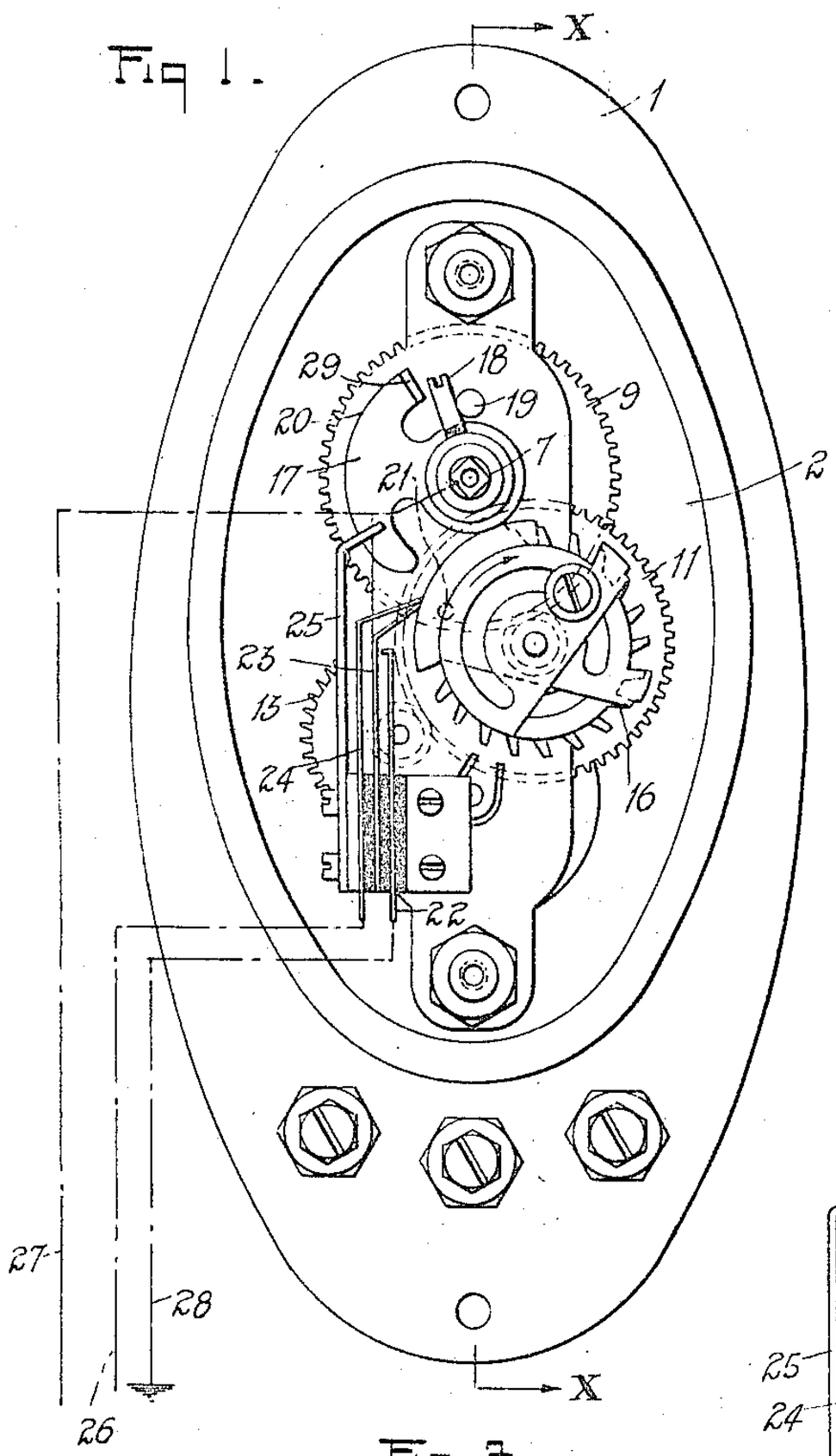


Fig 2.

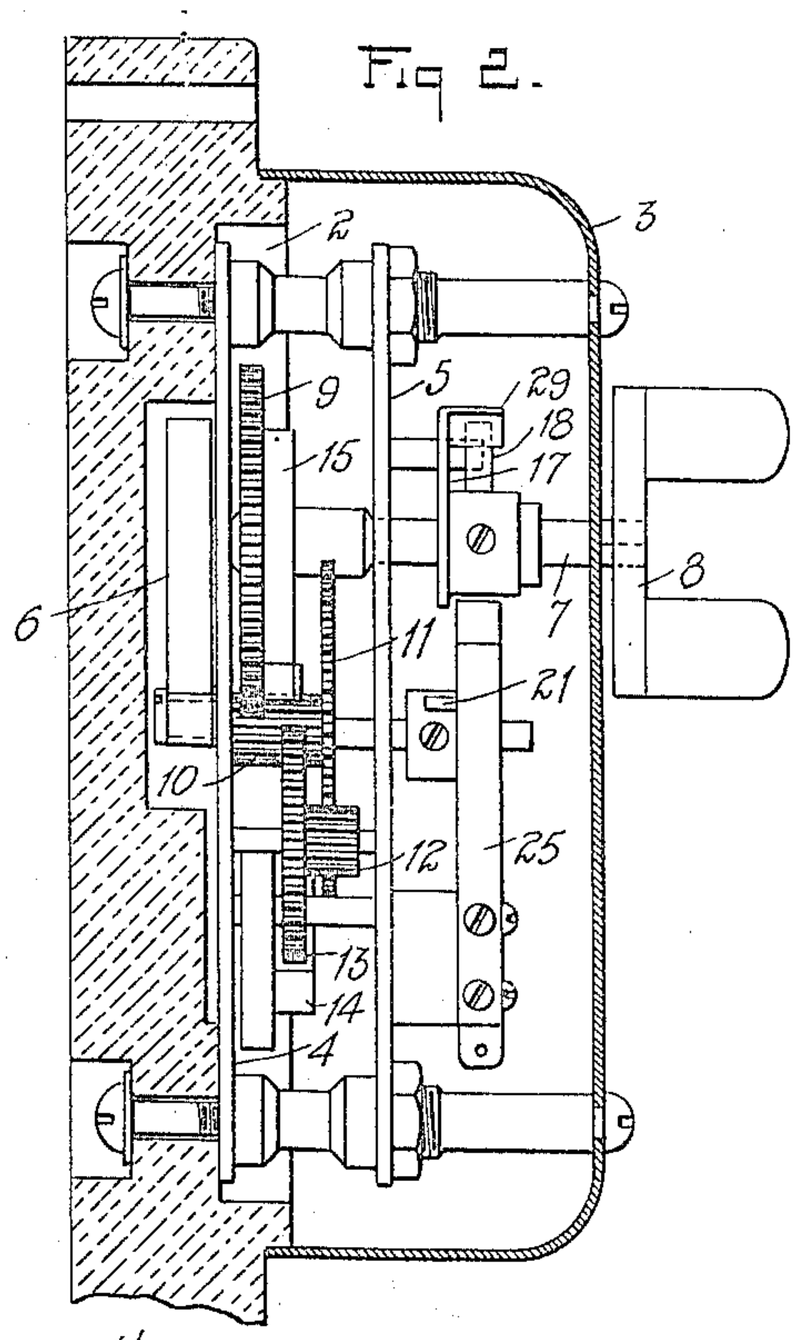


Fig 3.

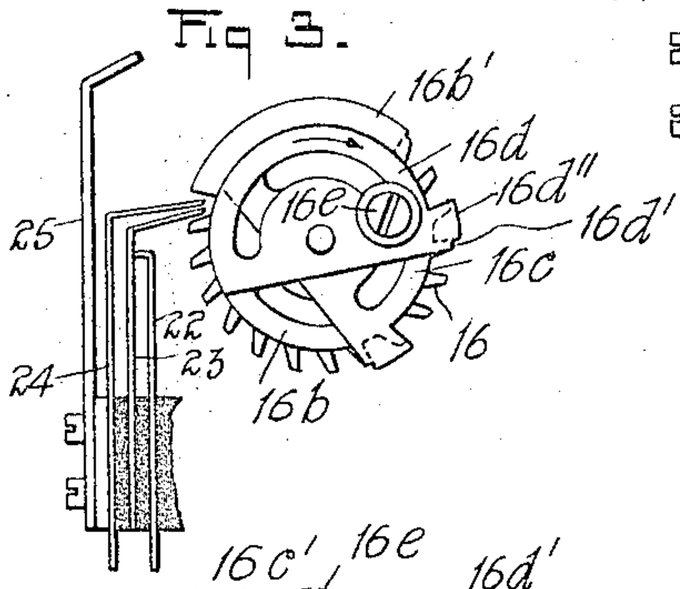


Fig 4.

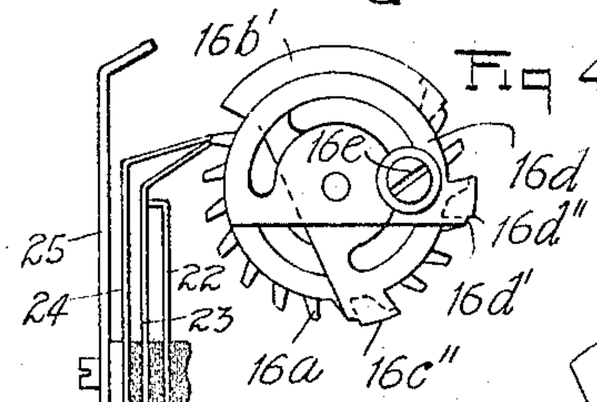


Fig 7.

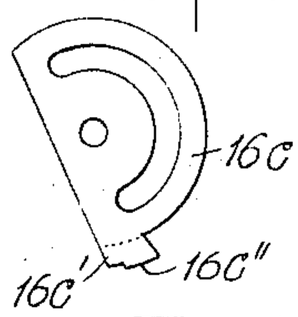


Fig 5.

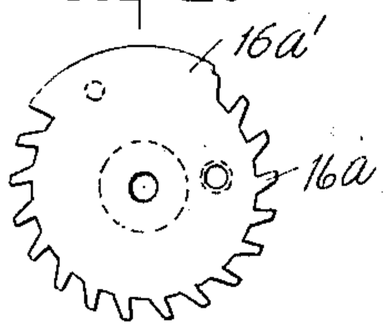


Fig 6.

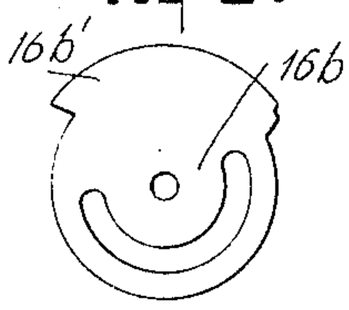


Fig 9.

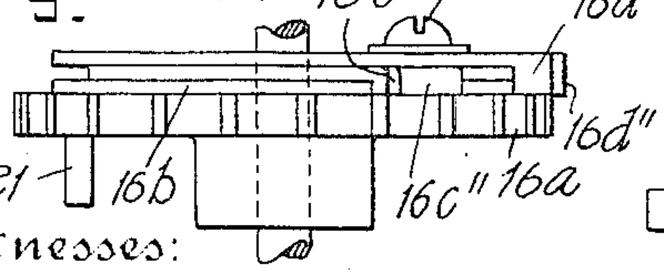
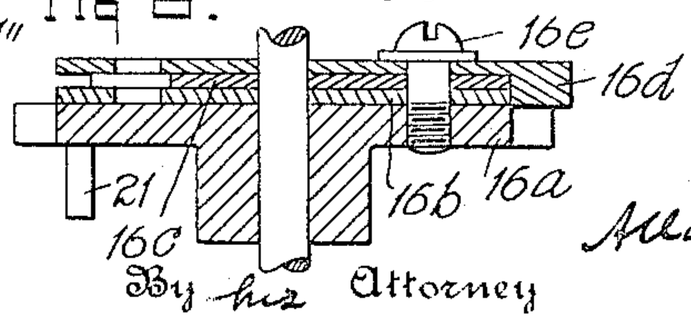


Fig 8.



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UNITED STATES PATENT OFFICE.

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CALL-BOX.

1,164,069. Specification of Letters Patent. Patented Dec. 14, 1915.

Application filed June 23, 1915. Serial No. 35,750.

To all whom it may concern:

Be it known that I, ALLISON A. CLOKEY, a citizen of the United States of America, and a resident of Jersey City, county of Hudson, and State of New Jersey, have invented certain new and useful Improvements in Call-Boxes, of which the following is a specification.

My invention relates to improvements in automatic transmitters such as are used in messenger call systems and the like, and are commonly termed call boxes. Such call boxes are commonly provided with double break wheels, toothed according to the number or signal to be transmitted by the box, and with contact pens adapted to be actuated by such break wheels, double break wheels and corresponding pens being provided in order that the box may operate both a metallic return circuit and a ground return circuit, according to the well known McCulloh system as set forth, for example, in the patent to M. W. Hamblin No. 808,451. Such boxes, as heretofore constructed, have been open to the following objections:

A. The signal number of a box cannot be changed without first making specially a double break wheel to replace the wheel initially furnished with the box. This necessitates the return of the box to the manufacturer for the required changes, which is so expensive and causes so much delay and trouble that it is practically never done.

B. Orders for call boxes almost always state the signal number required. In order to furnish any call boxes with the specified signal numbers, they are manufactured and assembled without any break wheels. When an order is received, a double break wheel of the required number is made and placed in the box before shipping. In order that the manufacturer may be able to supply such break wheels promptly it is the practice to provide a special machine for cutting such break wheels, which machine is idle except at such times as orders for break wheels may come in; and it will be noted that each break wheel must be made specially. Because of the necessity of cutting the break wheels according to specified numbers, after orders are received, considerable delay in filling orders frequently occurs; and because of the comparatively small quantity required on each order, the cost of the boxes is unduly great.

By the invention herein described I provide a break wheel which is adjustable to a great variety of signal numbers, and which may be constructed in advance of orders and permanently placed in the box and, after being so placed, may be adjusted by relatively unskilled labor to any signal number desired within the capacity of the wheel; and this may be done either in the shop or in the field and after the box has been placed; in other words, the signal number of the box may be changed from time to time after the box is in place and without removing it. My improved break wheel does not entail changes in the mechanism of the box, other than the break wheel itself and its contact pens.

My invention consists therefore, in improved adjustable signaling mechanism for call boxes and like transmitters; and in an improved adjustable break wheel.

The objects of my invention are, to make possible the adjustment of call boxes and like transmitters to various signal numbers without removal or replacement of any element of the mechanism; to make possible the construction of such transmitters complete, in advance of orders, and the adjustment of the boxes to desired signal numbers either when such boxes are to be shipped or after placement, or at any other time; to employ the ordinary motor mechanism of such call boxes, without change; to make the adjustment of the boxes to different signal numbers a matter of extreme simplicity capable of being performed by relatively unskilled labor; and to provide a very simple and inexpensive construction for accomplishing the above objects.

I will now proceed to describe my invention with reference to the accompanying drawings, and will then point out the novel features in claims.

In said drawings: Figure 1 shows a front elevation of one form of call box embodying my invention, the box being of well known type except as to the features in which my invention resides; the cover of the box having been removed. Fig. 2 shows a vertical longitudinal section of the box on the line *x*—*x* of Fig. 1. Figs. 3 and 4 are detail front elevations of the adjustable break wheel and contact pens therefor, Fig. 3 showing the wheel and pens in a position corresponding to the start of a signal and

Fig. 4 showing the parts in positions occupied when one of the lower teeth of the wheel are actuating corresponding pens. Fig. 5 shows a detail front view of the base member of the break wheel. Fig. 6 shows a detail front view of the lower intermediate member of the break wheel. Fig. 7 is a detail front view of the upper intermediate member of the break wheel (the upper member of the break wheel is similar). Fig. 8 shows a transverse axial section of the complete break wheel. Fig. 9 shows a side elevation of the complete break wheel.

In the drawings, 1 designates the base of the call box having within it a recess 2 for the reception of the mechanism of the call box, and 3 designates the cover of the box. As is usual in these call boxes, the mechanism comprises movement plates 4 and 5, a driving spring 6, a spring arbor 7 provided with an exterior operating handle 8, and a main gear 9 driving a gear train 10—11—12—13, the last gear 13 of this train being an escapement wheel motion of which is controlled by the ordinary escapement lever 14. The construction of such trains is so well known that detailed description or illustration thereof is not believed to be necessary. The mechanism also comprises the usual ratchet and pawl mechanism whereby rotation of the hand piece 8 may wind the spring 6; only the pawl spring 15 of this ratchet and pawl mechanism being shown. The mechanism also comprises suitable arbors for the gear train mentioned. The break wheel 16 is mounted upon the arbor of the gears 10 and 11 of the above mentioned train. The mechanism is provided with the usual stop segment 17 having a stop pin 18 which, when the spring 6 has been fully wound, engages stationary stop pin 19; the segment 17 having also the lip 20 with which a stop pin 21 on the under side of the break wheel engages when, after release of the break wheel, the latter has completed one revolution. This driving mechanism, including the stop segment and stop pins mentioned, is a familiar construction and does not form a portion of my invention, nor am I limited to the use of that particular driving mechanism or any particular driving mechanism.

The base member 16^a, of the break wheel, has uniformly spaced teeth of equal lengths about a portion of its periphery, the number of such teeth being somewhat greater than the maximum number of impulses embodied in any of the signals within the capacity of that wheel. The remaining portion, $16^{a'}$, of the wheel, is of slightly greater radius than the radius of the teeth, and is blank. Upon this base member 16^a are mounted blanking segments 16^b (shown in Fig. 6), 16^c (shown in Fig. 7) and 16^d (shown in Fig. 4). These segments 16^b, 16^c and 16^d are slotted as shown, are mounted to rotate about the arbor on which the base member 16^a is mounted, and, when once adjusted in proper position, may be clamped in place by means of a headed screw 16^e.

Contact pens 22, 23 and 24 are provided in connection with the break wheel, and of these pens 23 and 24 coact with the teeth of the break wheel as hereinafter described, while pen 22 is arranged to make and break contact with pen 23. A further pen 25 is provided which coacts with the stop segment 17 as hereinafter described. The lower intermediate break wheel segment 16^b has a blank portion $16^{b'}$ of a diameter substantially the same as that of the portion $16^{a'}$ of base member 16^a. Obviously the portion $16^{b'}$ of segment 16^b, if over more or less of the teeth of base member 16^a, will prevent the pens 23 and 24 from engaging such covered teeth of member 16^a. This segment 16^b is employed for limiting, at one end or the other of the signal, the number of teeth of the base member 16^a with which the pens 23 and 24 may engage.

The upper intermediate segment, 16^c, is provided with a short blanking segment $16^{c'}$ having a raised tooth portion $16^{c''}$; the lower portion of this blanking segment $16^{c'}$ is approximately of the same radius as the teeth of wheel 16^a; while the tooth portion $16^{c''}$ is of approximately the same radius as portion $16^{a'}$ of wheel 16^a; and as shown in Fig. 9, the portions $16^{c'}$ and $16^{c''}$ of member 16^c are flanged, so as to overlap the edge of 16^b.

The top segment 16^d has a similar blanking portion $16^{d'}$ of the same radius as the teeth 16^a and a raised tooth portion $16^{d''}$ of approximately the same radius as portion $16^{a'}$ of base member 16^a; and the portions $16^{d'}$ and $16^{d''}$ are flanged, as shown particularly in Fig. 9, to overlap the edges of segments 16^b and 16^c.

It will be clear from the above description and from Figs. 3 and 4, that the segments 16^b, 16^c, and 16^d, may be set at various positions so as to divide the toothed portion of base member 16^a into a number of different tooth-groups; and it will be clear that as the pens 23 and 24 ride over the blanking portions $16^{b'}$, $16^{c'}$, and $16^{c''}$, and $16^{d'}$ and $16^{d''}$, said pens are prevented from dropping into the spaces between the teeth of base member 16^a.

The circuits of the box are indicated in Fig. 1. 26 designates the line conductor, connected to pens 24 and 25; and 27 is a return conductor connected to the frame of the box. 28 is a ground conductor connected to pen 22; the grounded conductor 28 and pen 22 being employed in order that the box may operate, according to the McCulloh system, by means of a ground connection as well as by a metallic circuit.

Fig. 1 shows the parts in rest position,

except that the stop segment 17 is shown in the position occupied when the driving spring has been fully wound and the user is about to release the operating lever 8 in order to permit the box to send its signal. When the operating lever 8 is released the driving spring 6, driving the gear train, rotates the break wheel in the direction shown by the arrow. In the initial position pen 22 is out of contact with pen 23, and pens 23 and 24 are in connection with each other through the portion $16^{a'}$ of the wheel. When the break wheel begins to rotate, and pens 23 and 24 drop off the blank portion $16^{a'}$ of base member 16^{a}, they break connection with each other and with the break wheel, opening the metallic circuit 26—27; the pen 23 then makes contact with pen 22, as shown in Fig. 3. Each time the pens 23 and 24 ride over a tooth of the break wheel, pens 23 and 24 are first brought into electrical connection, as shown in Fig. 4, thereby grounding momentarily both sides of the circuit 26—27 through pen 22 and at the same time closing the metallic circuit 26—27 through pens 23 and 24; and then, as pen 23 drops off such tooth of the break wheel, it loses contact momentarily with the break wheel and with pen 24, thereby breaking the ground connection of both sides of the circuit; and when, immediately after, pen 24 drops off such tooth of the break wheel, the metallic circuit 26—27 is broken.

When pens 23 and 24 ride upon the blanking portion $16^{c'}$ or $16^{d'}$ of one or the other of the segments 16^{c} and 16^{d}, the effect is the same as when said pens ride up on one of the teeth of base member 16^{a}; but when these pens ride up upon the further raised portion $16^{c''}$ or $16^{d''}$ of one of the segments 16^{c} and 16^{d}, the ground connection is broken between pens 22 and 23; and of course, pens 23 and 24 are electrically connected so long as they are both upon one of the blanking portions $16^{c'}$, $16^{c''}$, or $16^{d'}$, $16^{d''}$, of segment 16^{c} and 16^{d}, so that the metallic circuit 26—27 is not broken until both pens have dropped off such blanking portion of segment 16^{c} or 16^{d}. These blanking portions $16^{c'}$, $16^{c''}$ and $16^{d''}$ by causing breaking of the ground connection, and by holding connection between pen 24 and the break wheel, provide the spaces necessary for separation of numeral groups of the box signal from each other.

Upon completion of one rotation of the break wheel the pin 21 engages the edge 20 of the stop segment 17, thereby bringing the mechanism of the box to rest; and at the same time a lug 29 on the stop segment 17 makes contact with pen 25, thus closing the metallic circuit 26—27 entirely independent of contact of the pin 26 with the break wheel, and so insuring that the metallic circuit 26—27 shall remain closed while the box is at rest. This extra contact between pen 25 and stop segment 17 insures that dust or the like, such as might happen to be upon the break wheel, shall not open the circuit 26—27 when the box is at rest; for if this circuit 26—27 should be open at one box while that box is at rest, the entire circuit, which may contain a great many boxes, would be broken, and thus all of the boxes be rendered inoperative. Of course, since this box is intended to be operated according to the McCulloh system, if the circuit should be opened as just described, the central station operator could cure the defect by throwing the usual central station McCulloh switch to cause all of the boxes to operate on ground return circuits only; but it is preferable to provide the boxes with contact means, such as brush 25, which shall hold the metallic circuit complete through the boxes, when those boxes are at rest; this is especially so, because trouble due to dust or the like raising the pens 24 out of contact with the break wheel, is a trouble which is very difficult to locate. The pen 25 is relatively rigid, as compared with the other pens, so that it is adapted to withstand the pressure exerted against it by the stop segment 17 due to the strong action of the spring 6; for this reason dust or the like on pen 25 will not prevent a good connection being made between said pen 25 and stop segment 17, the more so as the box mechanism does not come to rest immediately upon contact of lug 29 of stop segment 17 with brush 25, there being some sliding motion of this lug 29 over pen 25 before the box mechanism comes to rest; and this fact enables the pen 25 to act as a cushion to a considerable extent, in arresting the motion of the box mechanism.

What I claim is:—

1. A transmitter comprising an adjustable break wheel and a plurality of pens adapted to coact therewith, the break wheel consisting of a base member, toothed through a portion of its circumference, and having notches between its teeth, and having also a blank portion of a radius greater than the radius of said teeth, and one or more blanking segments mounted upon said base member but adjustable angularly with respect thereto, and each provided with a radially projecting blanking portion of a circumferential length sufficient to prevent said pen from dropping into a notch of the base member covered by such blanking portion and in part of a height greater than the radius of said teeth, two of said pens arranged to contact with each other when passing over the teeth and blank portion of said base member and over the blanking portions of said segments but to break contact relatively when they drop into the notches between the teeth of said base member, a third pen arranged

to make contact with one of said first mentioned pens when said first mentioned pens are in said notches or are passing over the teeth of said base member, such third pen arranged to break such contact when said first mentioned pens are passing over the larger radius portion of the base member, or over the larger radius portion of the blanking segments, and means for holding said segment or segments in various positions to which it or they may be adjusted.

2. A transmitter comprising an adjustable break wheel and a pen adapted to coact therewith, the break wheel consisting of a base member, toothed through a portion of its circumference, and having notches between its teeth, and a plurality of blanking segments mounted one above another on one face of said base member but adjustable angularly with respect to said base member, and each provided with a radially projecting blanking portion of a height and circumferential length sufficient to prevent said pen from dropping into a notch of the base member covered by such blanking portion, the outer of said blanking segments having its blanking portion flanged over the edge of the blanking segment beneath, and means for holding said segments in various positions to which they may be adjusted.

3. A transmitter comprising an adjustable break wheel and a plurality of pens, the break wheel consisting of a base member, toothed through a portion of its circumference and having notches between its teeth, and one or more blanking segments mounted upon said base member, but adjustable angularly with respect thereto, and each provided with a radially projecting blanking portion of a height greater than that of the teeth of said base member, two of said pens arranged to make contact with each other, one of such pens being arranged also to be actuated by the teeth and blanking projections of said break wheel, said pens arranged to retain contact one with another during passage of one said pen over the teeth of said break wheel, but to break contact one with another when passing over said projecting blanking portion of such segment or segments.

4. A transmitter comprising an adjustable break wheel and a plurality of pens, the break wheel comprising teeth with notches between its teeth, said teeth arranged in groups, the wheel provided with one or more blanking projections, of a height greater than such teeth, between tooth groups, two of said pens arranged to make contact with each other, one of such pens being arranged also to be actuated by the teeth and blanking projections of said break wheel, said pens arranged to retain contact one with another during passage of one said pen over the teeth of the said break wheel, but to break contact one with another when passing over said projecting blanking portion or portions of said break wheel.

5. A transmitter comprising a break wheel and a plurality of pens, the break wheel having teeth with notches between its teeth, and having one or more blanking projections separating the teeth into groups, and of greater height than said teeth, two of said pens arranged to make contact concurrently with said teeth, a third pen arranged to make contact with one of said first mentioned pens during the passage of the two first mentioned pens over the teeth of said wheel, but to break such contact during the passage of the two first mentioned pens over the blanking portion or portions of said wheel.

6. A transmitter comprising a break wheel and a plurality of pens, the break wheel comprising teeth with notches between its teeth and comprising also one or more blanking projections dividing the teeth into tooth groups and of a height greater than said teeth, said pens comprising a line circuit pen and another pen both arranged to contact concurrently with the teeth of said wheel, said pens comprising also a ground-circuit pen contacting with the second pen during the passage of the first two pens over the teeth of said wheel but arranged to break contact with said second pen during the passage of said second pen over the blanking projections of said wheel.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ALLISON A. CLOKEY.

Witnesses:
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PAUL H. FRANKE.