I. F. MANNY.

SELECTIVE SIGNALING APPARATUS.

APPLICATION FILED AUG. 8, 1910.

995,619.

Patented June 20, 1911.

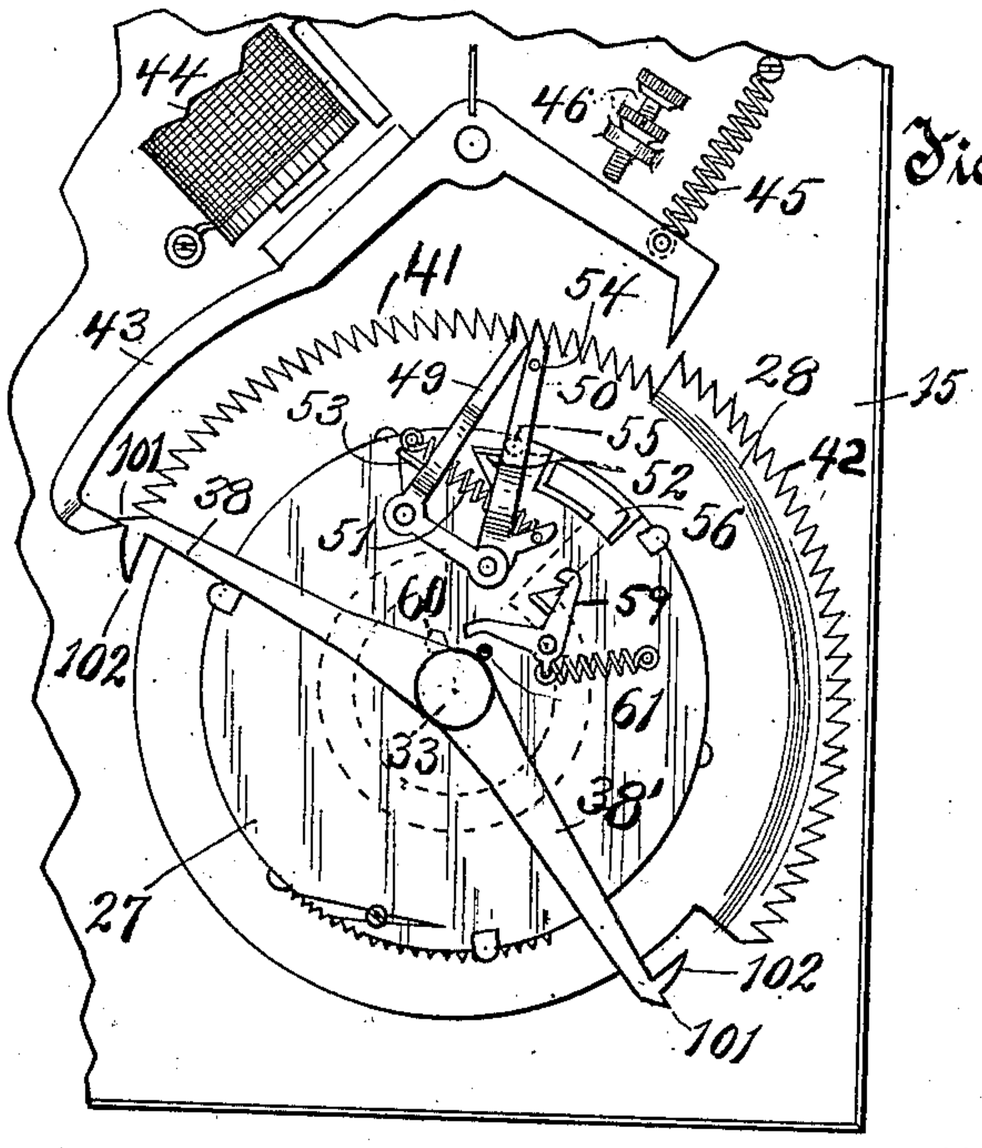


Fig. 1.

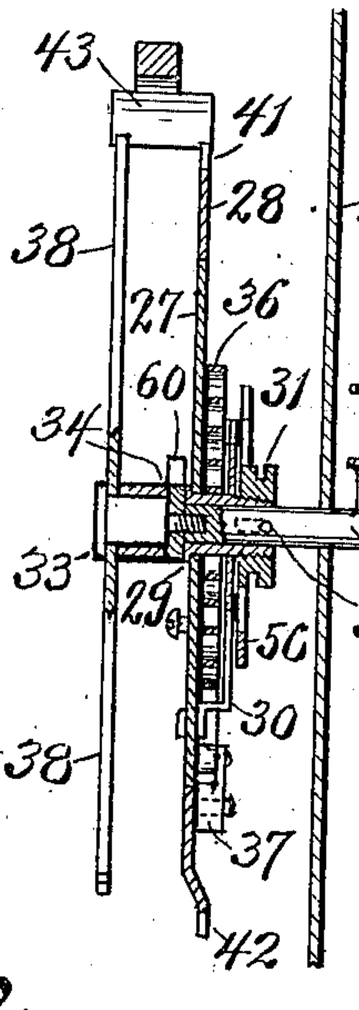
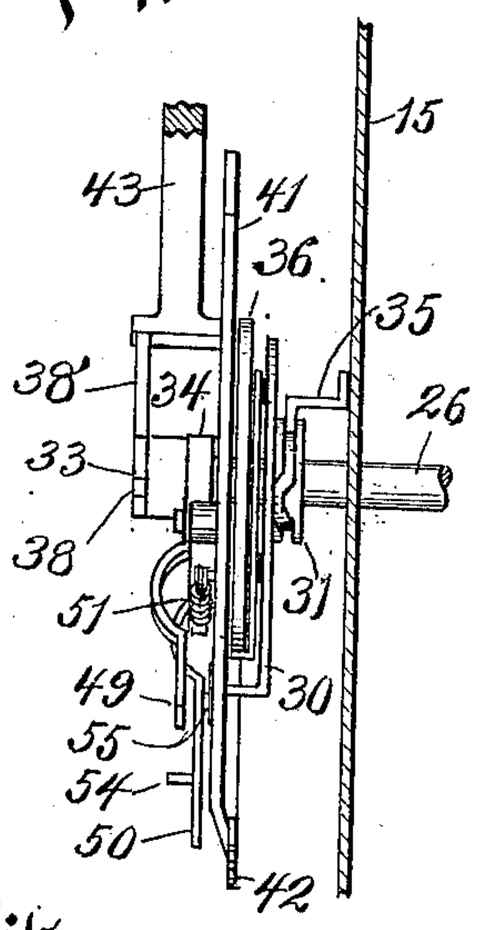
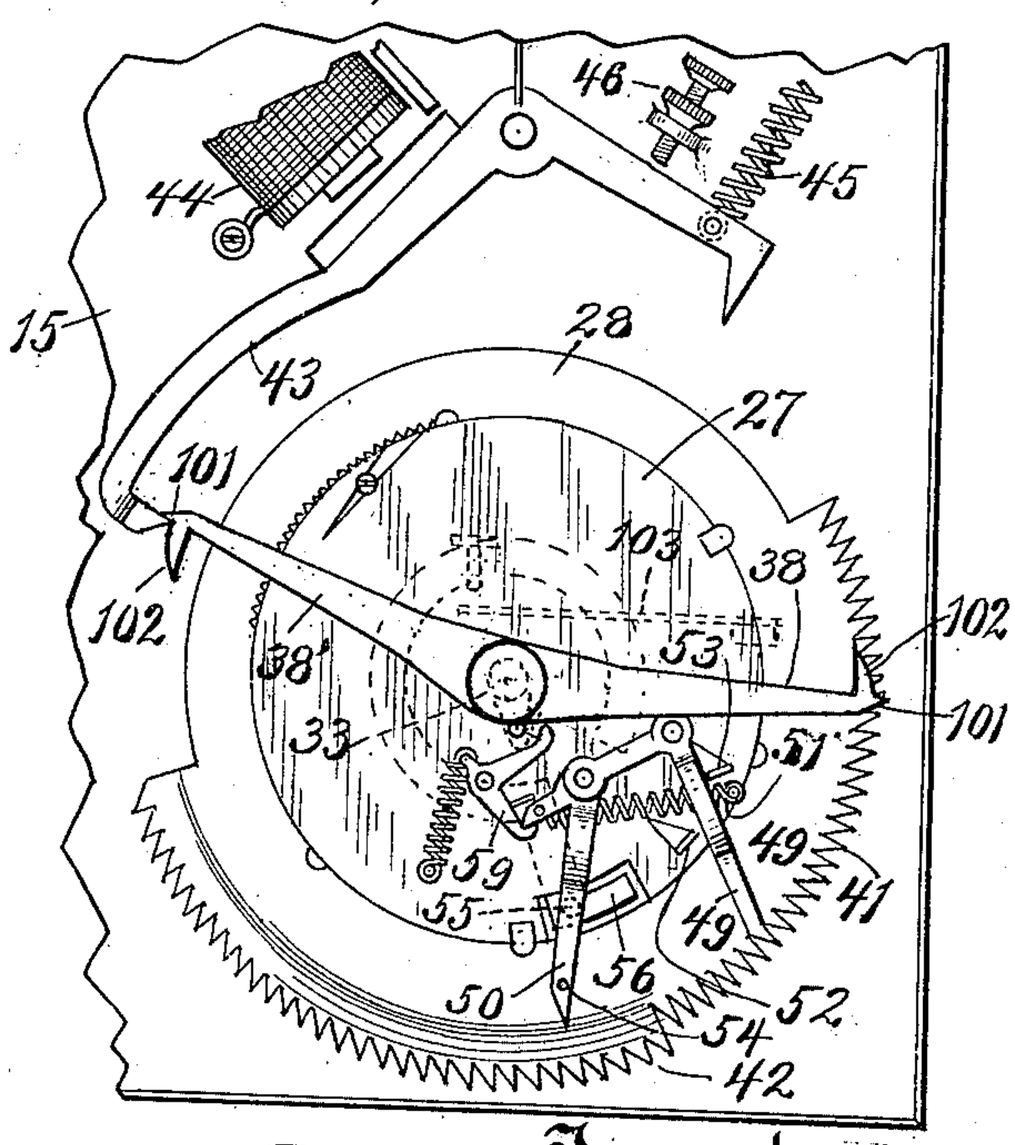


Fig. 3.

Fig. 2.

Fig. 2*.





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UNITED STATES PATENT OFFICE.

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SELECTIVE SIGNALING APPARATUS.

995,619. Specification of Letters Patent. Patented June 20, 1911.

Application filed August 8, 1910. Serial No. 576,151.

To all whom it may concern:

Be it known that I, IRA F. MANNY, a citizen of the United States, residing in Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Selective Signaling Apparatus, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention has for its object to provide lock-out means for selective signaling telephone systems such as shown in my United States Letters Patent No. 902,099, dated October 27, 1908, for selective signaling device, and such as shown in my copending application, Serial No. 530,327, filed November 29, 1909, for selective signaling means, so that during the time that the talking connection is maintained with the instrument signaled, it will be impossible for the other instruments to call central or to interfere with the talking circuit.

Another object of the invention is to provide a selective signaling device with a visible indicator to show when the line is in use.

Another object of the invention is to improve upon details of construction in order to simplify the device and reduce the cost of manufacture thereof.

The invention consists in the apparatus, its parts and in combinations of parts hereinafter particularly described and pointed out in the claims, and all equivalents thereof.

In the accompanying drawings I show an exemplifying structure embodying the invention, but it is to be understood that the invention is capable of embodiment in different forms.

Referring to the drawings in which like characters of reference indicate the same parts in the several views: Figure 1 is a front elevation of a selective signaling apparatus constructed in accordance with this invention, the parts being in their normal positions; Fig. 2 is a similar view thereof with the parts in the act of producing the signal or other circuit; Fig. 3 is a central sectional view thereof; and, Fig. 4 is a side elevation thereof.

In these drawings the parts are numbered like the corresponding parts of the application above referred to and are similar thereto in their construction and arrangement except as herein mentioned, so that reference is made to the specification and drawings of said application for a detailed description of the general device.

A frame 15 has a motor driven shaft 26 journaled therethrough with a rotary member and a starting arm on its projecting end. The rotary member is made up of a central disk-like portion 27 and an outer ring-like portion 28 surrounding the disk-like portion and adjustably connected therewith. The disk 27 loosely fits on a sleeve 29 against a shoulder at one end thereof, and is held in place on the sleeve by having a spider frame 30 secured thereto and also fitting on the sleeve to bear against a cam 31 on the other end of the sleeve. The sleeve 29 slidably fits upon the projecting front end of the motor shaft 26, being splined thereon to turn with the shaft while being slidably mounted on it by means of a pin 32 on the shaft fitting in slots of the sleeve. The sleeve is held on the shaft by means of a screw stud 33 threaded in the end of the shaft with a washer 34 therebetween, the sleeve engaging the washer to limit its outward movement. A stationary pin 35 projecting from the frame 15 fits in a cam groove of the cam 31 to slide the sleeve on the shaft as the result of the turning movement of the shaft, the sleeve and the parts carried by it being moved rearwardly and then forwardly with each rotation of the shaft. The rotary member is caused to turn by the turning movement of the sleeve because of a spring connection 36 therebetween, said spring being contained within the cage formed for it by the spider frame 30 and connected at one end to the sleeve and at the other end to an arm 37 on the ring portion 28 of the rotary member and permitting the rotary member to be detained during a portion of the rotary movement of the sleeve and causing it to quickly regain its lost motion as soon as released. The structure as thus far described, only differs from that shown in the application referred to, in that the stud 33 is concentric with the motor shaft instead of being eccentric thereto.

A starting arm 38 having a corresponding locking arm 38′, preferably made in one piece therewith, is rigidly mounted on the stud 33 without play thereon as in the former construction. A series of escapement teeth 41 is formed on the ring portion 28 of

the rotary member and is followed by another series of escapement teeth 42 which is preferably farther from the center of the shaft and depressed rearwardly out of the plane of teeth 41, as shown in Fig. 3. An anchor pawl 43, pivotally mounted on the frame, is adapted to engage with the teeth 41 and 42 to permit an escapement of the rotary member under the action of the motor as transmitted to it through the light spring 36. The outer end of the arm 38, as well as the outer end of the locking arm 38′, is provided with a spur 101 with a cam projection 102 in advance thereof, the spur being adapted for engagement with the anchor pawl 43.

The parts are normally held arrested by the engagement of the anchor pawl with the spur of the starting arm 38 and with the first tooth 41 of the rotary member, the end of the pawl being sufficiently broad to engage both of these parts as shown in Fig. 3. The starting arm thus restrains the motor while the rotary member is held with pressure in position against the pawl by the action of spring 36. The movement of the anchor pawl 43 to produce the escapement is caused by means of an electro-magnet 44 on the frame attracting its armature which is carried by the anchor pawl, the return movement being accomplished by a spring 45 and being limited by a set screw 46 which the pawl also engages. The object of the cam 102 is to force the pawl against the action of the spring toward the magnet for the purpose of bringing the armature closer to the magnet and reducing the amount of frictional engagement to be overcome by the pawl in releasing the starting arm when the magnet receives the first impulse.

After the starting arm has been released by the first impulse of the selective series of impulses sent from the central station, the motor being free, turns the motor shaft to advance the starting arm, while the rotary member is given an escapement by the successive operations of the anchor pawl until the selective series of impulses is completed. Then the escapement of the rotary member ceases while the movement of the motor shaft continues, meanwhile placing spring 36 under tension. When the movement of the motor shaft brings the offset portion of the cam groove of cam 31 into engagement with the arm 35, the sleeve 29 is caused to slide rearwardly on the motor shaft and thereby carry the rotary member out of the plane of engagement of the pawl so as to disengage the pawl therefrom. The rotary member being thus released from the pawl quickly turns under the action of spring 36 to take up the motion which it has lost by its detention.

Pivotally mounted on the disk portion 27 of the rotary member is a bell crank lever 49 having one arm extending alongside of one of the teeth 41 and the other arm provided with a signaling member 50 pivoted thereon and normally standing alongside of the tooth 41 following the tooth by which the end of lever 49 stands. A spring 51 connects the signaling member 50 with the disk portion 27 of the rotary member in such a manner that it tends to hold both the signaling member 50 and the lever 49 in their normal positions just described, against stops 52 and 53 respectively which are preferably formed by lugs bent up from the disk 27. The spring 51 is adapted to return either the signaling member alone to its normal position, or the lever 49 with the signaling member. The lever 49 and the signaling member 50 are arched to avoid the spring 51 as shown in Fig. 4, and the signaling member has a projecting pin 54 on its front face for engagement with the lever 49, and a contact lug 55 on its rear face capable of engaging with a contact 56 which projects through an opening in the disk portion 27 of the rotary member without engaging the walls thereof. The contact 56 comprises the end of a strip of metal which is carried by the disk 27 but is insulated therefrom and has an electrical contact maintained therewith by means of a spring brush, not shown, during the movement of the rotary member.

When the number of impulses of the selective series of impulses sent from the central or signaling station to all of the sub stations on the line corresponds with the number of a particular instrument, the rotary member of such instrument is permitted an escapement which is just sufficient to bring into engagement with the anchor pawl that tooth 41 which stands alongside of the signaling member 50, and consequently, when the change in position of the rotary member is effected by the action of cam 51, the signaling member 50 will be engaged by the pawl and be detained thereby while the rotary member turns under the action of spring 36 to take up its lost motion with relation to the motor shaft, and such detention of the signaling member by the pawl causes such member to swing on its pivotal connection with the lever 49 and into engagement with the spring contact 56, as shown in Fig. 2, where it escapes from its engagement with the pawl by its angular position but is caught by a spring actuated bell crank dog 59 on the disk 27 and is locked thereby against returning to its normal position. An electrical circuit is completed by the engagement of the signaling member 50 with the contact 56 to produce a signal or to establish a talking circuit for this particular instrument in any desirable manner.

The signaling member 50, being locked in its contacting position by the dog 59 continues the circuit established by it, and the

locking arm 38′ comes into engagement with the pawl 43 to detain the motor and also the rotary member, the latter by the engagement of a lug 60 projecting from the washer 34 with a pin 61 on the disk 27. In this locking position the parts are held during the conversation and until the central operator sends another signaling impulse over the line to restore all of the instruments to their normal positions. Such clearing impulse releases the locking arm 38′ from engagement with the pawl 43 and the parts proceed with the remainder of their cycle of movement until the first tooth 41 of the rotary member again engages the pawl. The rotary member thus being brought to rest while the motor continues its operation, causes the lug 60 to force its way from behind the curved end of dog 59 and moves said dog to release the signaling member and permits its spring to return it to its normal open position. The lug 60 has acquired its position behind the curved end of dog 59 by reason of the shifting of the rotary member on the motor shaft, the end of the dog passing the lug 60 while the rotary member is in the rear position and being brought into the plane of the lug when the rotary member is returned to its front position. Immediately after the release of the signaling member, the starting arm comes into engagement with the pawl, first forcing the pawl to retreat by the action of the cam 102 so as to be closer to the core of the magnet and then engaging the spur 101 therewith to bring the motor to rest with all the parts in their normal positions.

Should the number of impulses in the series of signaling impulses be greater than the number of the instrument under consideration, it is obvious that the signaling member then having passed the pawl 43, will not be engaged thereby when the rotary member is shifted and the signaling circuit at that station will not be affected. When, however, the number of impulses in the series of signaling impulses is less than the number of the instrument under consideration, the guard lever 49 will be in a position to be first engaged by the pawl and will be swung thereby to withdraw the signaling member 50 from the path of the pawl and both the guard lever and the signaling member will escape from the pawl without the signaling member being brought into engagement with spring contact 56, the spring 51 restoring both signaling member and the lever 49 to their normal positions as soon as they are released from the pawl.

The instruments of the stations which were not signaled are held in the locked position of the parts above described, as well as the instrument of the station signaled, with the difference that the signaling member of such instruments is not in engagement with the signaling contact and consequently the talking circuit controlled by such engagement of the signaling member with the signaling contact only includes the instruments of the station signaled and the said other stations are deprived of their means for calling central, which means are only operative when the rotary member is in its normal position. At the end of the connection, when central sends the clearing impulse over the line, all instruments are restored to their normal positions and thus the means for calling central are rendered again operative. The switch 103 which is closed by a cam on the motor shaft only when the parts are in their normal positions is shown as illustrating the control of a central calling circuit.

The horizontal position of the starting arm, as shown in Fig. 2, constitutes a visible indication that one of the instruments in the circuit is in talking connection and that the central calling means is therefore inoperative.

Any suitable signal means may be provided at each station dependent upon the engagement of the signaling member with the signal contact for signaling the station, or the central operator may send a ringing current over the line after the instruments have been brought to their locking position, which ringing current will only affect the instruments signaled by reason of such engagement.

I desire it to be understood that this invention is not limited to any specific form or arrangement of parts except in so far as such limitations are specified in the claims.

What I claim as new and desire to secure by Letters Patent is:

1. A selective signaling apparatus, comprising a suitably operated pawl, a motor driven rotary member having escapement teeth engaged by the pawl, means for disengaging the rotary member from the pawl, a signaling member on the rotary member in position to be engaged by the pawl when the rotary member is disengaged from the pawl at a position in which the pawl engages a tooth corresponding to the number of the signaling apparatus, whereby the position of the signaling member is changed to produce a signal and a locking means connected with the rotary member and adapted to engage the pawl for locking the rotary member in the position in which the signaling member produces the signal.

2. A selective signaling apparatus, comprising a suitably operated pawl, a motor driven rotary member having escapement teeth engaged by the pawl, means for disengaging the rotary member from the pawl, a signaling member movable with the rotary member in position to be engaged by the pawl when the rotary member is disengaged therefrom at a position in which the pawl

engages the tooth corresponding to the number of the signaling apparatus, a contact carried by the rotary member and adapted to be engaged by the signaling member for closing an electrical circuit, and a locking member having connection with the rotary member and adapted to engage the pawl and thereby lock the rotary member in the position in which the signaling member engages the contact.

3. A selective signaling apparatus, comprising a suitably operated pawl, a motor driven rotary member having escapement teeth engaged by the pawl, means for disengaging the rotary member from the pawl, a signaling member moving with the rotary member in position to be engaged by the pawl when the rotary member is disengaged from the pawl at a position in which the pawl engages the tooth corresponding to the number of the signaling apparatus, a signaling contact carried by the rotary member and insulated therefrom and adapted to move into engagement with the signaling member when the latter is detained by the pawl, means for temporarily locking the signaling member in its position of engagement with the signaling contact, and a locking arm connected with the rotary member for engaging the pawl to lock the rotary member in the position in which the signaling member is locked in engagement with the signaling contact.

4. A selective signaling apparatus, comprising a suitably operated pawl, a motor shaft, a rotary member slidably mounted on the motor shaft and adapted to receive motion therefrom, means for disengaging the rotary member from the pawl, a signaling member carried by the rotary member in position to be engaged by the pawl when the rotary member is disengaged from the pawl at a position in which the pawl engages the tooth corresponding to the number of the signaling apparatus to change the position of the signaling member for producing a signal, and a locking arm on the motor shaft adapted to be engaged by the pawl for locking the rotary member in the position in which the signaling member produces the signal.

5. A selective signaling apparatus, comprising a suitably operated pawl, a motor shaft, a rotary member mounted on the motor shaft and adapted to receive motion therefrom, means for disengaging the rotary member from the pawl, a signaling member carried by the rotary member in position to be engaged by the pawl when the rotary member is disengaged from the pawl at a position in which the pawl engages the tooth corresponding to the number of the signaling apparatus for changing the position of the signaling member to produce a signal, a starting arm on the motor shaft adapted to engage the pawl in the starting position of the rotary member to be released simultaneously with the rotary member, and a locking arm also carried by the motor shaft and adapted to be engaged by the pawl for locking the motor shaft and the rotary member in the position of the rotary member in which the signaling member produces the signal.

6. A selective signaling apparatus, comprising a magnet, a pawl operated thereby, a motor shaft, a rotary member mounted on the motor shaft and adapted to receive motion therefrom, means for disengaging the rotary member from the pawl, a signaling member carried by the rotary member in position to be engaged by the pawl when the rotary member is disengaged from the pawl at a position in which the pawl engages the tooth corresponding to the number of the signaling apparatus for changing the position of the signaling member to produce a signal, a starting arm on the motor shaft adapted to engage the pawl in the starting position of the rotary member to be released simultaneously with the rotary member, and a locking arm also carried by the motor shaft and adapted to be engaged by the pawl for locking the motor shaft and the rotary member in the position of the rotary member in which the signaling member produces the signal, said starting arm and said locking arm being provided with cams for forcing the pawl toward the magnet.

7. A selective signaling apparatus, comprising a magnet, a pawl operated thereby, a motor shaft, a rotary member mounted on the motor shaft and adapted to receive motion therefrom, means for disengaging the rotary member from the pawl, a signaling member carried by the rotary member in a position to be engaged by the pawl when the rotary member is disengaged from the pawl at a position in which the pawl engages the tooth corresponding to the number of the signaling apparatus, and a starting arm on the motor shaft adapted to engage the pawl in the normal position of the rotary member, said starting arm being provided with a cam for forcing the pawl nearer to the magnet as the parts approach their normal position.

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

IRA F. MANNY.

Witnesses:
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