

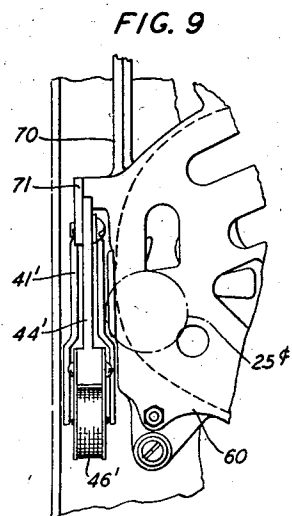
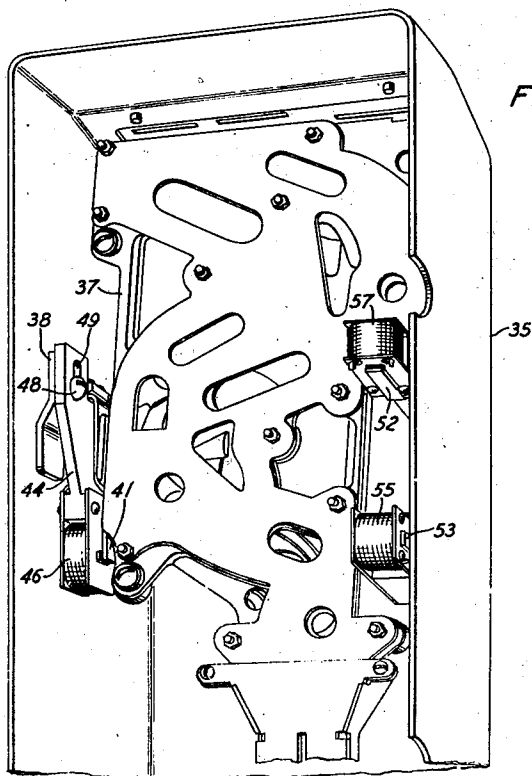
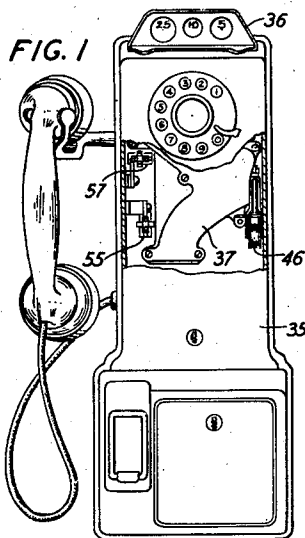
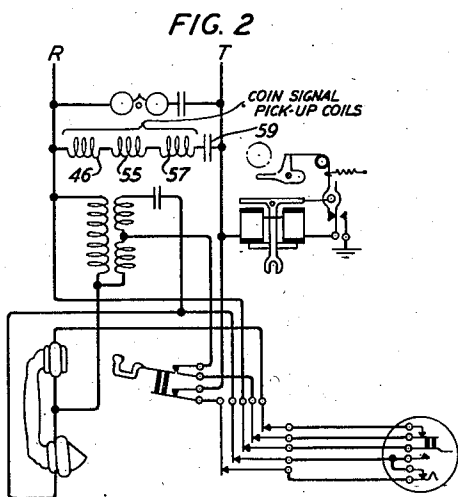
Dec. 29, 1942.

T. L. DOWEY ET AL
TELEPHONE COIN COLLECTOR

2,306,531

Filed Oct. 5, 1939

7 Sheets-Sheet 1



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FIG. 4

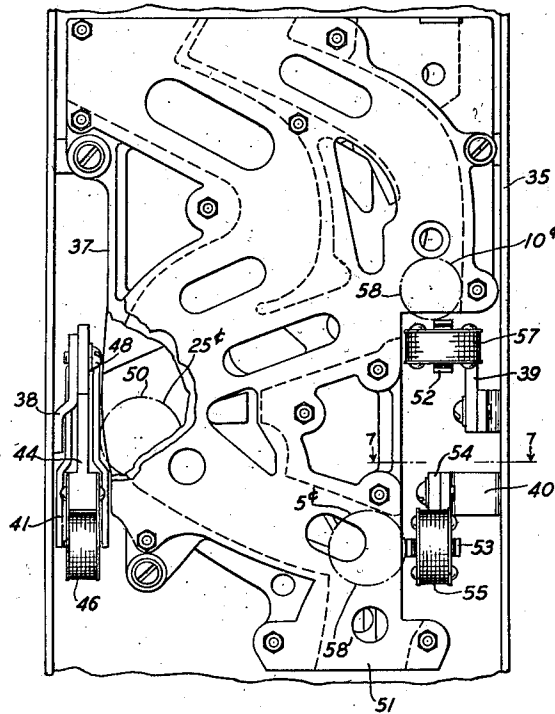


FIG. 8

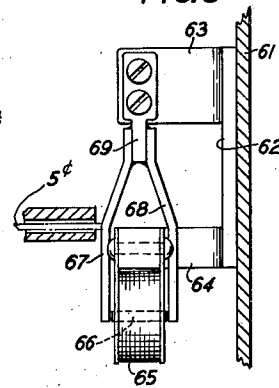


FIG. 5

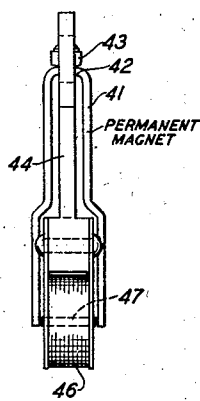


FIG. 6

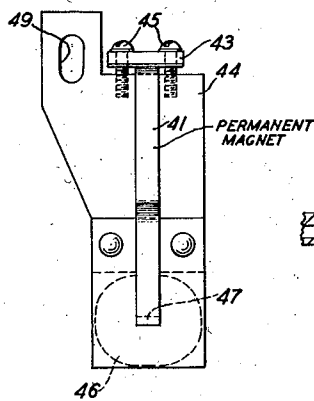
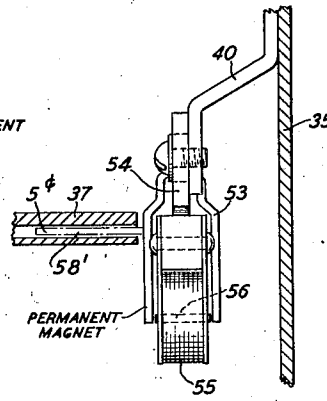


FIG. 7



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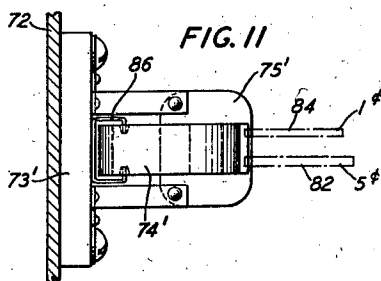
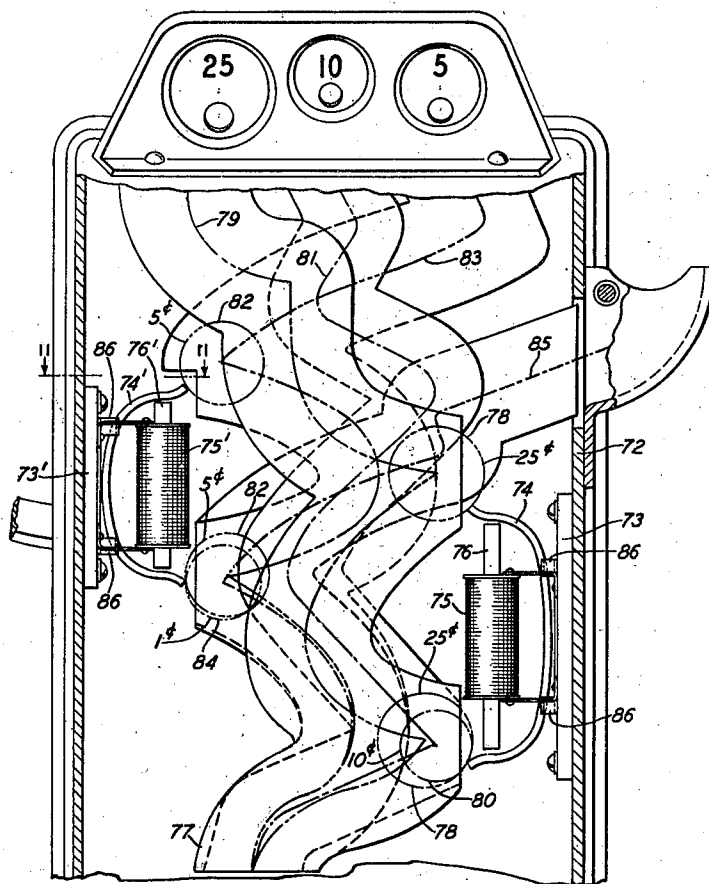
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FIG. 10



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FIG. 12

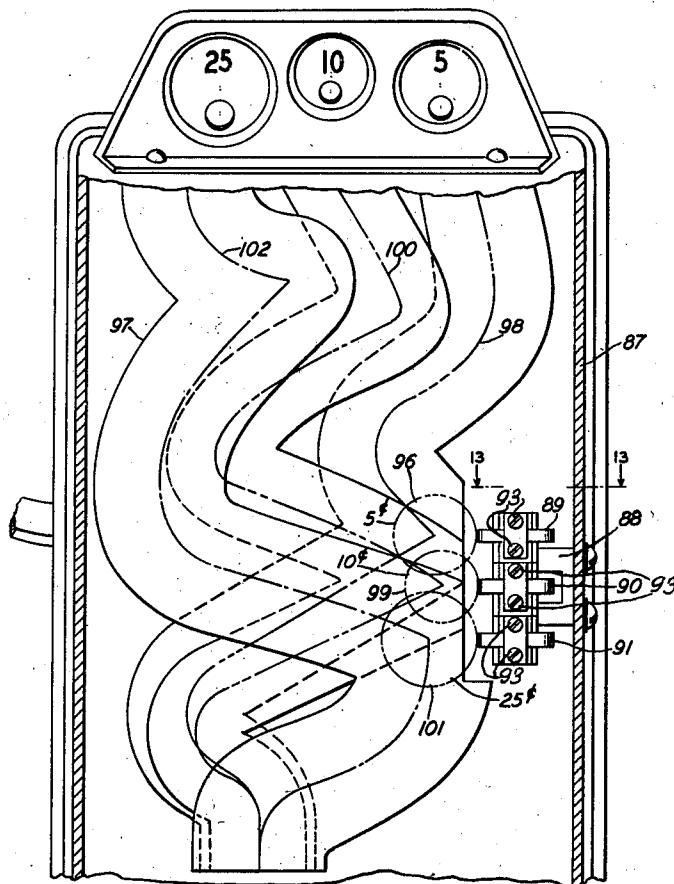


FIG. 13

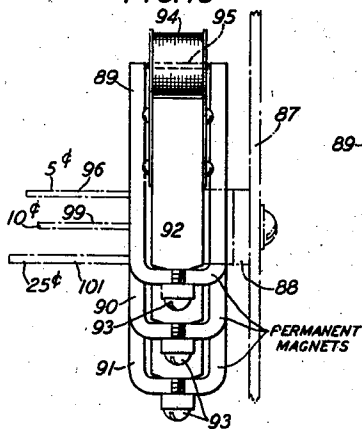
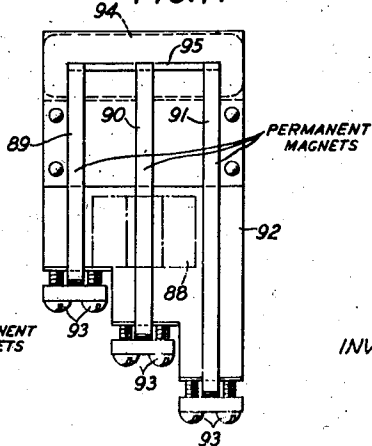


FIG. 14



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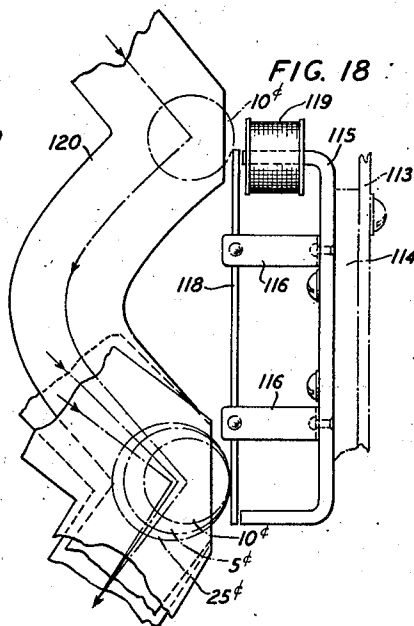
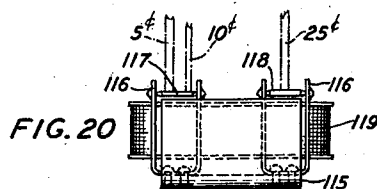
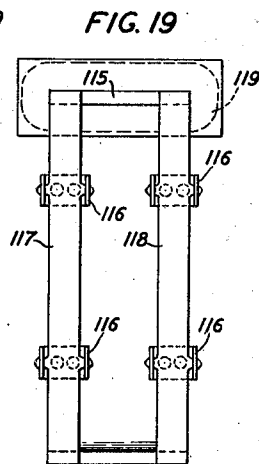
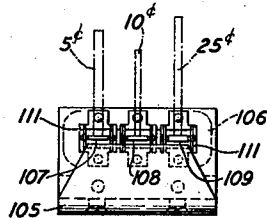
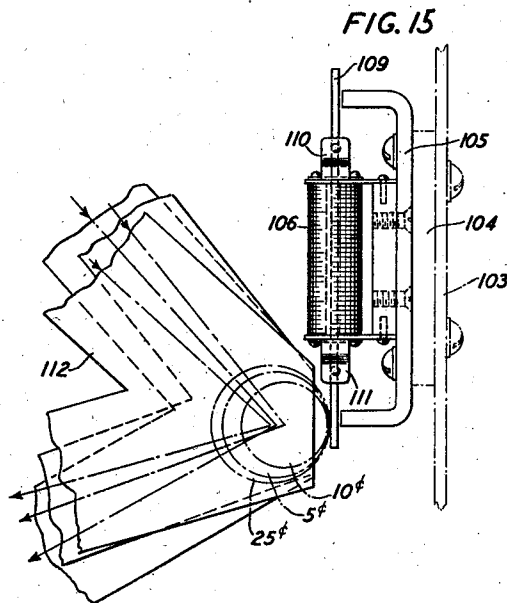
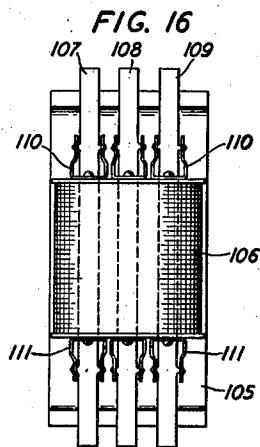
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FIG. 22

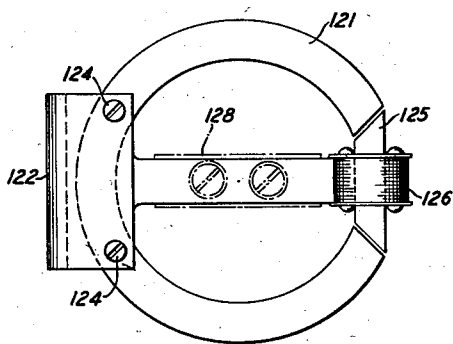


FIG. 21

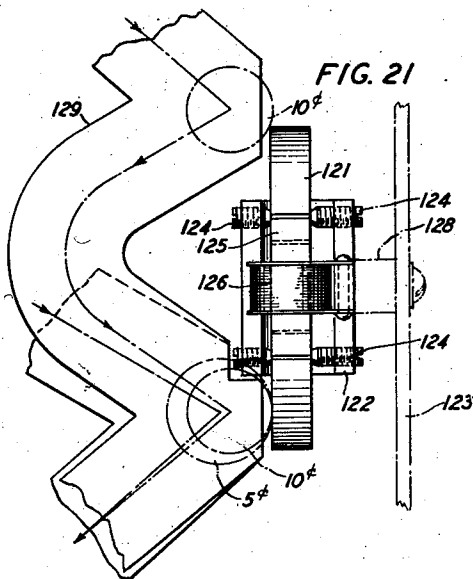


FIG. 23

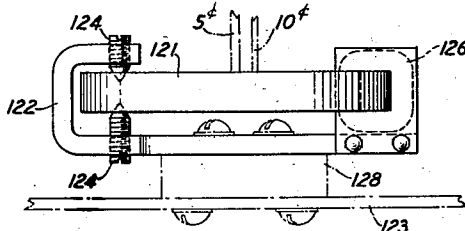


FIG. 25

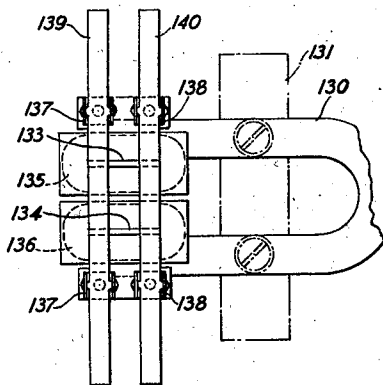


FIG. 24

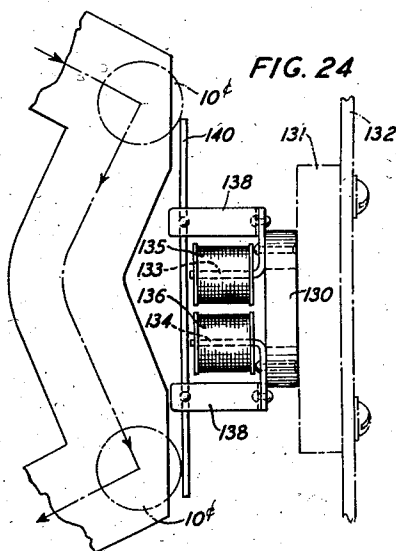
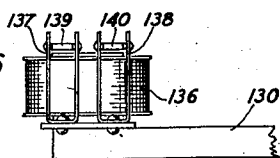


FIG. 26



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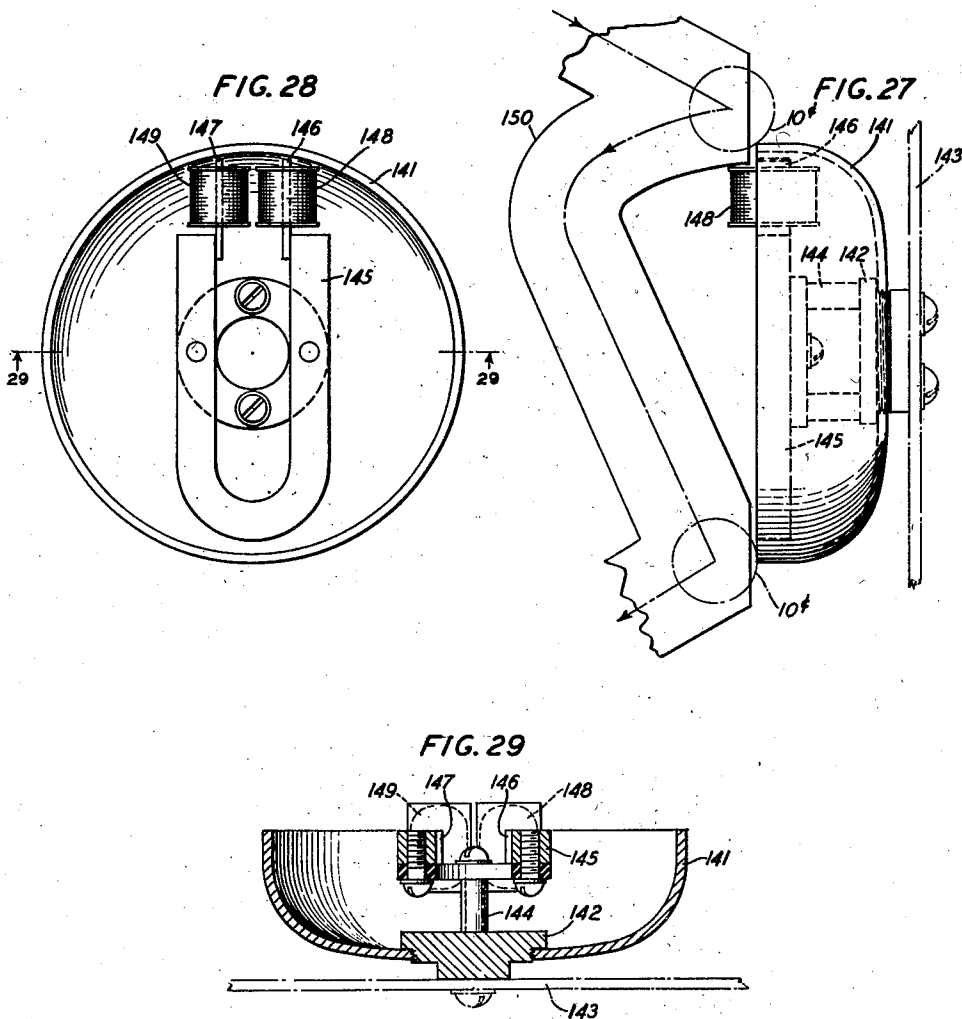
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TELEPHONE COIN COLLECTOR

2,306,531

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7 Sheets-Sheet 7



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UNITED STATES PATENT OFFICE

2,306,531

TELEPHONE COIN COLLECTOR

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Application October 5, 1939, Serial No. 297,974

8 Claims. (Cl. 194—1)

This invention relates to telephone coin collectors and has for an object the provision in such a collector of improved means for producing coin actuated signals for notifying the remote central office of coin deposit.

In the usual coin collector, for example, of the type disclosed in O. F. Forsberg U. S. Patent 1,043,219, issued November 5, 1912, the coin signals such as a gong and a bell, are mounted in resonant connection with the voice transmitter whereby the vibrations of the gong or bell resulting from coin actuation are impressed upon the voice transmitter to produce corresponding electrical currents for transmission to the central office.

In the preferred form of this invention the deposited coin is caused to strike a vibratory member forming part of the magnetic circuit of a transmitter of the electromagnetic type. For example, the coin-operated signal generator of this invention may comprise a bar magnet mounted for vibration at its natural period when struck by a deposited coin, and a solenoidal winding having a stationary core substantially bridging the gap between the free ends of the bar magnet. When such a bar is set into vibration by a deposited coin it will be apparent that a current will be generated in the coil of a frequency determined by the natural frequency of vibration of the bar magnet. In order to provide distinctive signals for deposited coins of different denominations, a similar coin signal transmitter of the above type may be employed for each coin denomination except that each bar magnet may be designed to have a different period of vibration. If desired, each bar magnet may be U-shaped substantially in the form of the ordinary tuning fork with the pick-up coil and its stationary core mounted between the free ends of the fork. The force applied to such a fork in causing it to vibrate under coin impact has no discernible effect in tending to demagnetize it.

In an alternative form the coin actuated electromagnetic structure of this invention may comprise a straight bar of magnetic material mounted at its nodal points for free vibration at its natural period when struck by a deposited coin, the magnetic circuit being completed by a yoke member substantially bridging the gap between the ends of the bar. Either the bar or the yoke is a permanent magnet and the pick-up coil surrounds a suitable portion of the magnetic circuit. Still other alternative forms are con-

templated as will be understood from the detailed description that follows.

Referring to the drawings:

Fig. 1 is a front view partly in section of a telephone coin collector embodying the coin signal mechanism of this invention;

Fig. 2 is a diagram of the substation circuit of the coin collector;

Fig. 3 is a rear view in perspective of the upper housing of the coin collector showing three coin actuated signal generators of the electromagnetic type;

Fig. 4 is a rear elevation of the upper housing of Fig. 3;

Figs. 5 and 6 are different views of the quarter coin signal mechanism of Fig. 4;

Fig. 7 is a view of the nickel coin signal mechanism of Fig. 4;

Fig. 8 represents a different type of fork construction;

Fig. 9 discloses a different manner in which the coin signal mechanism of this invention may be mounted for coin actuation;

Fig. 10 illustrates an upper housing embodying a coin signal mechanism employing a different type of magnetic circuit from that disclosed in the earlier figures;

Fig. 11 is a top view of one of the coin signal mechanisms of Fig. 10;

Fig. 12 illustrates an upper housing embodying a multiple coin signal mechanism employing a branched magnetic circuit with a common pick-up coil;

Figs. 13 and 14 are different views of the coin signal mechanism of Fig. 12;

Figs. 15, 16 and 17 represent different views of an alternative coin signal mechanism in which each coin actuated portion of the branched magnetic circuit comprises a straight bar supported at its nodal points for free vibration at its natural period with a common pick-up coil surrounding the coin actuated bars;

Figs. 18, 19 and 20 are different views of a multiple coin signal mechanism somewhat similar to that of Fig. 15 except that the pick-up coil surrounds a stationary portion of the magnetic circuit;

Figs. 21, 22 and 23 illustrate an alternative coin signal mechanism in which the magnetic circuit comprises a substantially ring-shaped member divided by air-gaps into a stationary portion and a vibratory portion;

Figs. 24, 25 and 26 illustrate an alternative coin signal mechanism in which the magnetic

circuit comprises reeds vibrating in the field of a U-shaped permanent magnet;

Figs. 27, 28 and 29 illustrate a further embodiment of the invention in which the vibratory portion of the magnetic circuit is bell-shaped.

The coin collector shown in Fig. 1 is, in general, similar to the coin collector of O. F. Forsberg U. S. Patent 1,043,219 except that the collector of Fig. 1 is of the handset type and embodies the coin actuated signaling devices of the present invention. As described in the Forsberg patent the upper housing 35 of the collector has a multiple coin gauge 36 for receiving coins of various denominations and for directing them into separate channels of a coin chute 37 where they are tested as to genuineness and any spurious coins discarded. Coin chute 37 directs each coin in the usual manner into a coin hopper where it is held in suspense on a coin trap and subsequently collected or refunded depending upon whether or not the desired telephone connection is obtained, as is usual in collectors of the prepay type. However, if the collector is of the postpay type any deposited coin discharged from the coin chute 37 would pass directly into the cash compartment for collection.

In such collectors, it is also customary to provide coin actuated signaling elements such as a gong and a bell whose vibrations due to coin actuation are impressed upon a transmitter for producing signalling currents for transmission to the central office to give notice of the proper coin deposit. The present invention is concerned mainly in the provision of improved means for producing signaling currents in response to the deposit of coins of various denominations.

In the form of the invention shown in Figs. 1, 3, 4, 5, 6 and 7 it is assumed that the collector is adapted to receive quarters, dimes and nickels, and three separate coin signal elements are mounted within the upper housing 35 adjacent the multiple coin chute 37 for selective actuation by the deposited coins. The quarter signaling device is mounted on a suitable support 38 secured to the left inner wall of the upper housing as shown in Fig. 4 adjacent a side wall opening in the quarter channel of coin chute 37 to enable the device to be struck by each deposited quarter but not by any other coin. Mounted on the right-hand side of the upper housing as viewed in Fig. 4 is another coin signaling device supported by bracket 39, the device being located adjacent an opening in the dime channel of the coin chute to enable it to be struck by each deposited dime but not by a coin of any other denomination. Also supported on the same side wall by bracket 40 is a third coin signaling device located adjacent side wall openings in the nickel and dime runways of the coin chute 37 to enable it to be actuated by each deposited nickel and each deposited dime but not by a coin of any other denomination.

The quarter signaling device of Figs. 1, 3 and 4 is shown in greater detail in the enlarged views of Figs. 5 and 6. It comprises a bar magnet 41 bent to U shape similar to a tuning fork and having its middle portion 42 clamped between a block 43 and the upper edge of the supporting plate 44 by means of two screws 45. The lower end of plate 44 supports a solenoidal winding 46 having a stationary core 47 extending substantially between the free ends of bar magnet 41 with a small air-gap between each end of the bar magnet and the adjacent end of the stationary core. The described mounting arrangement is, therefore, such that when one of the tines of the

bar magnet 41 is struck by a deposited quarter, fork 41 vibrates freely at its own natural period, thereby varying the magnetic flux traversing coil 46 and generating in coil 46 an electromotive force of a frequency corresponding to the natural period of vibration of fork 41. The electromotive force generated in coil 46 may in a suitable manner be transmitted over the telephone line associated with the collector to notify the remote central office that a quarter has been deposited.

It may be noted particularly in Fig. 3 that the mounting plate 44 is adjustably fastened to support 38 by means of a screw 48 passing through a slot 49 in plate 44 to enable the bar magnet 41 to be properly aligned with respect to the associated coin chute 37 and preferably the arrangement is such that a quarter strikes the adjacent prong of fork 41 at a point about three-fifths of the distance between the free end and the clamped portion 42. In Fig. 4 a quarter 50 is shown in dotted lines which in traversing the quarter channel of coin chute 37 strikes fork 41 before reaching the coin exit 51 of the chute for subsequent collection or refund as the case may be.

It is assumed that the multicoin chute 37 is of substantially the same construction as that claimed in the Forsberg patent and is adapted to permit a deposited nickel to strike one signaling device, and a deposited dime to strike the nickel signal as well as a second signal of the same character. Hence, the two forks or U-shaped bar magnets 52 and 53 are so mounted adjacent the right-hand side of the coin chute as shown in Fig. 4 that a deposited nickel strikes only fork 53 while a deposited dime strikes the two forks 52 and 53 successively in the same manner as the bell of the Forsberg patent is struck twice by a deposited dime, but only once by a deposited nickel. An enlarged top view of the assembly of fork 53 is shown in Fig. 7. The bar magnet 53 is clamped against the supporting plate 54 in the same manner as shown in Figs. 5 and 6 for fork 41 to permit the free vibration of fork 53 when one of its prongs is struck by a deposited nickel or dime. One end of plate 54 is suitably fastened to bracket 40 while the other end supports a solenoidal winding 55 having a stationary magnetic core 56 which bridges the gap between the free ends of fork 53 except for a small air-gap between each end of the fork and the adjacent end of the stationary core.

The U-shaped bar magnet 52 and its pick-up coil 57 are mounted in the same manner from bracket 39 except that the two prongs of fork 53 lie in a horizontal plane while the two prongs of the fork 52 lie in a vertical plane. As previously stated, the construction of coin chute 37 is such that a deposited nickel 58' strikes only fork 53 while a deposited dime 58 strikes both of the forks 53 and 52 to give an audible signal much in the same manner as a deposited dime strikes both the upper edge and the lower edge of the bell disclosed in the above-mentioned Forsberg patent. It may also be assumed that forks 52 and 53 are identical and have the same natural period of vibration but their natural period of vibration should, of course, be substantially different from the natural period of the quarter fork 41 in order that the tone current generated in pick-up coil 55 or 57 may be clearly distinguished by the central office operator from the tone current generated in coil 46. It may be noted that greater amplitude of vibration is produced when the plane of the coin in striking the fork is per-

pendicular rather than parallel to the length of the fork.

As shown in the typical coin collector substation circuit of Fig. 2, the three coin signal pick-up coils 46, 55 and 57 are connected across the telephone line in series with each other and in series with a condenser 59 of large capacity, the condenser being included for the purpose of preventing the flow of direct current through the pick-up coils. In one particular embodiment the two forks 52 and 53 had a natural period of vibration of 1100 cycles per second, and fork 41 a natural period of 400 cycles per second, and each pick-up coil consisted of about 6000 turns.

In Fig. 8 there is shown the top view of an alternative fork construction for the coin signal device of Fig. 7. Welded to the vertical side wall 61 of the upper housing is a bracket 62, one arm 63 of which supports a permanent magnet in the shape of a tuning fork, while its other arm 64 supports a coil 65 and core 66 between the free ends of the fork. This fork magnet may be of welded construction comprising two prongs 67, 68 welded to opposite sides of a block 69 which has an extension suitably fastened to bracket arm 63. Block 69 and prongs 67, 68 are permanently magnetized whereby the vibrations of prongs 67, 68 produced by a coin striking prong 67 will generate the desired signaling current in coil 65. The form of fork shown in Fig. 8 not only would be economical in manufacture but the energy dissipation would be less than for the bent bar construction of Fig. 7. In Fig. 8, as well as in the other forms of the invention, it is assumed that a mounting of non-magnetic material is employed for the coin-operated signal generator.

In the form of the invention shown in Figs. 3 to 7 the coin signal devices are mounted on brackets 38, 39 and 40 attached to the inner side walls of the upper housing. In Fig. 9 an alternative mounting arrangement of a quarter coin signal is disclosed wherein the device is mounted from the coin chute instead of being supported directly from the upper housing. The cover plate 60 for the coin chute 70 has an angular extension 71 which serves as a substitute for the bracket 38 of Fig. 4 in supporting a quarter signal mechanism identical with the signal mechanism of Fig. 5 and comprising a U-shaped bar magnet 41' and a pick-up coil 46' mounted on the plate 44'.

An alternative form of coin signal mechanism is disclosed in Figs. 10 and 11 embodied in a coin collector of the type accepting pennies as well as nickels, dimes and quarters, for example of a type similar to that disclosed in the F. A. Hoyt United States Patent 2,204,083, issued June 11, 1940, on coin collectors. Two similar coin signal mechanisms are disclosed in Fig. 10, one for pennies and nickels, and the other for dimes and quarters. Attached to one side wall of upper housing 72 is a mounting bracket 73 from which is supported at its nodal points a curved bar magnet 74 adapted to have only its lower end struck by a deposited dime and adapted to have both its upper and lower ends struck by a deposited quarter. Also mounted from bracket 73 is a pick-up coil 75 having a stationary core member 76 substantially bridging the gap between the free ends of magnet 74 except for a small air-gap between each end of core 76 and the adjacent end of bar magnet 74.

The nickel and penny coin signal mechanism mounted on the opposite side wall of the upper housing is of similar construction and comprises a bar magnet 74' mounted at its nodal points

from bracket 73', the pick-up coil 75' having a stationary core member 76'. Both permanent magnets 74 and 74' are adapted to vibrate at their natural period of vibration when struck by a deposited coin, but fork 74' being shorter than fork 74 will vibrate at a substantially higher frequency than fork 74 so that the tones from the two forks may be readily distinguished. In the construction shown in Fig. 10 the paths taken by the coins through the coin chute 77 are such that a deposited quarter strikes both the upper and lower ends of magnet 74, a deposited dime strikes only the lower end of bar 74, a deposited nickel strikes both the upper and lower ends of fork 74' and a deposited penny strikes only the lower end of fork 74'. The path taken by a deposited quarter 78 is indicated by the broken line 79 showing that the quarter strikes both ends of fork 74. The path taken through the coin chute by a deposited dime 80 is indicated by broken line 81 showing that the dime strikes only the lower end of fork 74. The path taken by a deposited nickel 82 is indicated by the broken line 83 showing that the nickel strikes both the upper and the lower ends of magnet 74'. The path taken by a deposited penny 84 is indicated by the broken line 85 showing that the penny strikes only the lower end of fork 74'. Each time a free end of one of the forks 74, 74' is struck by a deposited coin the resulting vibration of the fork at its natural period generates a current of corresponding frequency in the associated pick-up coil 75 or 75' and this signaling current is transmitted to the central office to establish the character of the deposited coin.

A top view of the nickel and penny signal mechanism is shown in Fig. 11 and illustrates one manner in which the fork 74' may be supported at its nodal points. Mounted on bracket 73' are two spaced spring clips 86, the free ends of which are pressed into slots in opposite edges of the fork 74' at its two nodal points. The fork 74' is supported solely by these two spring clips to enable it to vibrate freely at its natural period. It is, of course, to be understood that fork 74 may be supported in a similar manner.

An alternative form of the invention shown in Figs. 12, 13 and 14 is for a coin collector accepting nickels, dimes and quarters. Mounted on one side wall of upper housing 87 is a bracket 88 for supporting three U-shaped forks or bar magnets 89, 90 and 91, one for each type of coin to be deposited. The three forks are so mounted from different portions of the mounting plate 92 by means of screws 93 that the free ends of the three forks lie in a common vertical plane even though the three forks are of different lengths with different natural periods of vibration. The three forks have a common pick-up coil 94 also mounted on plate 92 with a flattened core member 95 substantially bridging the gap between the two ends of each of the three forks whereby the vibration of any one of the three forks will generate a current in coil 94 of a frequency determined by the natural period of the fork being vibrated. The path taken by a deposited nickel 96 in the coin chute 97 is indicated by broken line 98 showing that the nickel strikes only fork 89. The path taken by a deposited dime 99 is indicated by broken line 100 showing that the dime strikes only fork 90. The path taken by a deposited quarter 101 is indicated by the broken line 102 showing that the quarter strikes only fork 91. The construction of coin chute 97 is such as to direct each coin against its fork and

prevent each coin from striking either of the other two forks. Each coin preferably strikes its fork at a point about three-fifths of the distance between the free end and the clamped portion of the fork as shown in Fig. 13.

Another form of the invention is shown in Figs. 15, 16 and 17 wherein the coin actuated members are in the form of reeds of magnetic material such as "Permalloy" subjected to the magnetic flux from a stationary permanent magnet. Fastened to the side wall 103 of the upper housing is an insulating block 104 on which is mounted a stationary bar magnet 105 with its spaced ends bent substantially parallel to each other. Also mounted from block 104 is a pick-up coil 106, and freely passing through coil 106 are three spaced vibratory reeds of magnetic material 107, 108 and 109. Spring clips such as clips 110 and 111 are mounted on the spool-heads for winding 106 for supporting each vibrating reed at two spaced points, preferably the nodal points of each reed. The aperture through coil 106 is large enough that each reed is not in contact with the inner face of winding 106 or its spool and the spring clip supports for each reed are such that each end of each reed is separated by a small air-gap from the adjacent end of the stationary permanent magnet 105. In the particular embodiment shown, the two arms of each spring clip such as clip 110 have conical recesses into which fit protuberances from opposite edges of the reed but other types of mounting may also be used to permit the free vibration of each reed when struck by a deposited coin.

In Fig. 15 a fragment of a multiple coin chute 112 is shown with individual coin channels for quarters, dimes and nickels laterally spaced from each other in such a manner that side wall openings in the channels permit a deposited nickel to strike the lower end of its reed 107, a deposited dime to strike the lower end of its reed 108 and a deposited quarter to strike the lower end of its reed 109. The lateral spacing of the three coin channels is indicated by the spaced positions of the coins shown in Fig. 17. The coin entrance and the coin exit portions of multiple chute 112 are not shown since they may be of substantially the same form as shown in the earlier figures. It should be obvious that whenever one of the reeds 107 to 109 is set into vibration by a deposited coin the resulting variations in the magnetic flux from permanent magnet 105 threading coil 106 will generate a corresponding alternating current in coil 106 which may be transmitted over the telephone line to indicate the character of coin deposit.

A further alternative form of the invention shown in Figs. 18 to 20 which is somewhat similar to that of Figs. 15 to 17 in that reeds are employed, but contains the further modification that the pick-up coil surrounds the stationary permanent magnet. Mounted on the side wall 112 of the coin collector upper housing is a block 114 of non-magnetic material on which is mounted a permanent magnet 115 similar to magnet 105 of Fig. 15. Supported by suitable spring clips 116 are two parallel spaced vibratory reeds 117, 118 of magnetic material, each reed being supported by the spring clips at its two nodal points in such a manner that small air-gaps exist between each end of both reeds and the adjacent end of permanent magnet 115. The pick-up coil 119 surrounds the permanent magnet 115 and hence serves as a generator of an alternating current of a frequency determined by the natural period

at which reed is vibrated due to a deposited coin. The multiple coin chute 120, only a portion of which is shown, has an individual channel for quarters, dimes and nickels so arranged that a deposited nickel will strike only the lower end of reed 117 but a deposited dime will strike reed 117 twice, once at its upper end and once at its lower end, and a deposited quarter will strike reed 118 only at its lower end. The vibration of reeds 117, 118 thus produces in coil 119 signaling currents indicative of the character of the coin deposited. As an alternative, each of the reeds 117, 118 may be a permanent magnet and yoke 115 merely a return path of magnetic material.

In another form of the invention disclosed in Figs. 21 to 23 the coin actuated vibratory member is a ring-shaped permanent magnet 121 suitably mounted on bracket 122 which is fastened by means of block 128 to the side wall 123 of the coin collector upper housing. Set screws 124 fastened through spaced arms of bracket 122 enter conical depressions in the ring 121 whereby the ring is securely mounted at its nodal points for free vibration at its natural period. As shown particularly in Fig. 22 a small section of ring 121 has been cut out and replaced by a stationary core section 125 of magnetic material surrounded by a pick-up coil 126, the core of the coil being supported by an extension of bracket 122. The ends of the stationary core 125 are separated by small air-gaps from the adjacent ends of the permanent magnet 121 whereby the coin actuated vibration of ring 121 will generate in coil 126 an alternating current of a frequency determined by the natural period of ring 121. The width of these air-gaps may be adjusted by moving coil 126 and core 125 along a radius of ring 121. As shown in Fig. 21 the associated multicoin chute 129 is so arranged that a deposited nickel strikes only the lower portion of ring 121 but a deposited dime strikes both the upper and the lower portion of the ring; and it may be assumed that for a deposited quarter a similar sound signaling mechanism (not shown) is employed except that its vibratory ring has a different natural period from that of ring 121.

The coin signaling mechanism of Figs. 24 to 26 employs a stationary horseshoe permanent magnet 130 supported by block 131 which is fastened to side wall 132 of the coin collector upper housing. The magnet has two angular pole-pieces 133, 134 which serve as the cores for two pick-up coils 135 and 136. Mounted on extensions of pole-pieces 133 and 134 are two pairs of spring clips 137, 138 for supporting at their nodal points two reeds 139, 140, respectively of magnetic material, the said reeds being adapted to be set into vibration by coins traversing the coin chute in the upper housing. The free ends of pole-pieces 132 and 134 are spaced by small air-gaps from both reeds 139 and 140 so that the vibration of either reed varies the magnetic flux through both coils 135, 136. Only a portion of the dime runway is shown in Fig. 24, it being assumed that a deposited dime strikes reed 140 twice, once at its upper end and once at its lower end. The nickel coin channel may be readily arranged such that a deposited nickel will strike reed 140 only once and the quarter channel may be constructed to permit a deposited quarter to strike reed 139 only once. It, of course, is assumed that reeds 139 and 140 have substantially different natural periods of vibration in order that the remote central office operator may receive distinctive signals from the vibration of the two reeds. It is,

of course, assumed that the two coils 135 and 136 are connected in series aiding across the telephone line is somewhat the same manner as the pick-up coils shown in Fig. 2.

In the form of the invention shown in Figs. 27 to 29 the coin actuated vibratory member comprises a bell 141 of magnetic material suitably mounted on insulating block 142 which is fastened to the vertical side wall 143 of the collector upper housing. Supported by a post 144 extending from plug 142 is a stationary horseshoe magnet 145 having pole-pieces 146 and 147 serving as core members for two pick-up coils 145, 149, the ends of the pole-pieces being separated from the inner surface of bell 141 by small air-gaps. In Fig. 27 the dime coin channel 150 is disclosed so arranged that a deposited dime strikes both the upper portion and the lower portion of bell 141 to produce a signaling current in coils 148 and 149 of a frequency determined by the natural period of vibration of bell 141.

This invention is capable of still further embodiments as indicated by the scope of the appended claims.

What is claimed is:

1. In a coin collector, an electromagnetic signal generator having a substantially closed magnetic circuit, a vibratory member of magnetic material included in said circuit, a portion of said circuit being permanently magnetized, an electrical winding surrounding a portion of said magnetic circuit, and means for directing a deposited coin into engagement with said member.

2. In a coin collector, a magnetic circuit comprising an elongated member of magnetic material, means remote from the ends of said member for supporting said member to permit said member to vibrate at its natural period when struck by an object, a stationary magnetic member substantially joining the ends of said first member with air-gaps between adjacent ends of said members, one of said members comprising a permanent magnet, a coil surrounding one of said members, and means for causing a deposited coin to strike said first member.

3. In a coin collector, a magnetic circuit comprising an elongated member of magnetic material, means remote from the ends of said member for supporting said member to permit said member to vibrate at its natural period when struck by an object, a stationary magnetic member substantially joining the ends of said first member with an air-gap between adjacent ends of said members, one of said members comprising a permanent magnet, a coil surrounding one of said members, means for causing a deposited coin of one denomination to strike only one end of said first member, and means for causing a deposited coin of a different denomination to strike said first member twice in succession.

4. In a coin collector, an electromagnetic device comprising a magnetic core, a winding surrounding said core, a permanent magnet having a base portion with a pair of prongs extending therefrom for free vibration at their natural period when struck by an object, means for mounting said core and said coil between the ends of said prongs with a small air-gap between each end of said core and the adjacent prong, and means for directing a deposited coin into engagement with one of said prongs with sufficient force to set said prongs into vibration.

5. In a coin collector, a magnetic circuit com-

prising a plurality of aligned elongated members of magnetic material, means for supporting said members to permit each member to vibrate at its natural period independently of the other members, a common yoke member of magnetic material substantially joining the one group of ends of said members to the other group of ends of said members with a small air-gap between each end of said yoke and the adjacent ends of said members, an electrical coil surrounding a portion of said magnetic circuit, a portion of said magnetic circuit being permanently magnetized, means for directing a coin of one denomination into engagement with one of said members, and means for directing a coin of a different denomination into engagement with another of said members.

6. In a coin collector housing, a coin signaling device comprising a magnetic circuit, means for developing a magnetomotive force in said circuit, said circuit comprising an elongated bar of magnetic material of substantially uniform density and cross-section, mounting means attached to an intermediate point of said bar to permit the free vibration of both ends of said bar at the natural period of said bar, said magnetic circuit also including a stationary magnetic core adjacent said bar and carrying a magnetic flux which fluctuates in intensity in accordance with the vibrations of said bar, a coil surrounding said core, and means for causing a deposited coin to strike said bar at a point intermediate said mounting means and one of the free ends of said bar.

7. In a coin collector, an electromagnetic transmitter comprising a plurality of U-shaped permanent magnets mounted adjacent each other with one prong of each magnet lying substantially in a common plane and with the other prong of each magnet lying substantially in a common plane spaced from and substantially parallel to the other plane, a stationary core of magnetic material extending between the prongs in one plane and the prongs in the other plane, a coil surrounding said core whereby an electrical current is generated in said coil in response to the vibration of any one of said magnets, each of said magnets having a different natural period of vibration, means for guiding a deposited coin of one denomination into engagement with a prong of one of said magnets and means for guiding a deposited coin of a second denomination into engagement with a prong of a second of said magnets.

8. In a coin collector, a plurality of vibratory reeds of magnetic material, means for mounting said reeds parallel to each other for permitting each reed to vibrate independently of any other reed, a common yoke member of magnetic material extending between opposite ends of said reeds with a small air-gap between each end of said member and the adjacent ends of said reeds, said yoke member being permanently magnetized, an electrical coil surrounding said yoke, means for causing a deposited coin of one denomination to strike one of said reeds a single blow, means for causing a deposited coin of a second denomination to strike said one reed two successive blows, and means for causing a deposited coin of a third denomination to strike a second of said reeds.

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