Oct. 27, 1942. A. K. SMITH ET AL 2,299,854

TELEPHONE COIN COLLECTOR

Filed April 2, 1941 3 Sheets-Sheet 1

FIG. 1

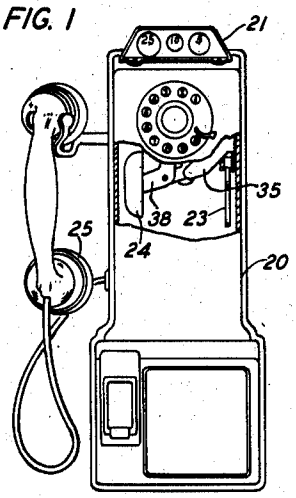

FIG. 2

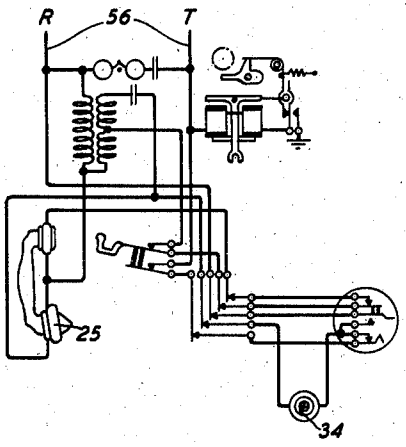

FIG. 3

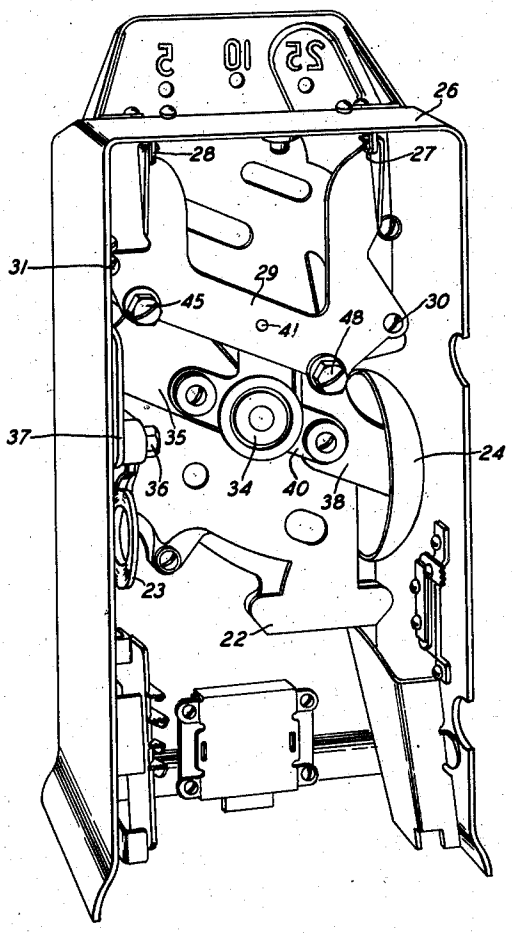

FIG. 4

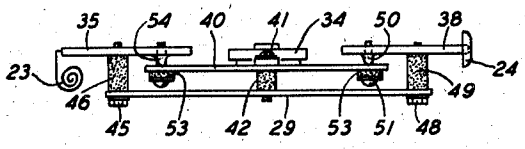

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FIG. 5

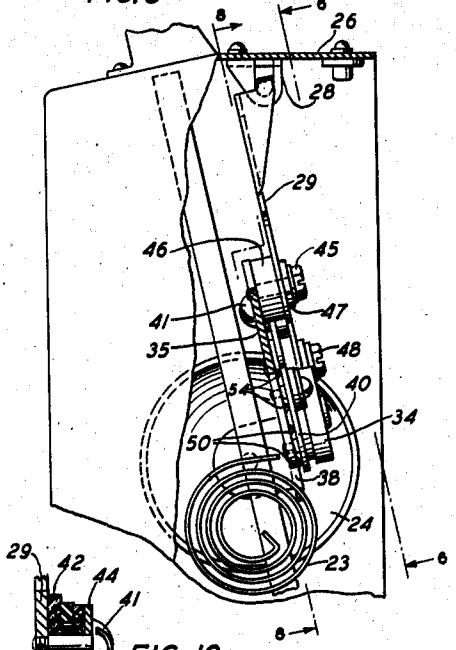

FIG. 6

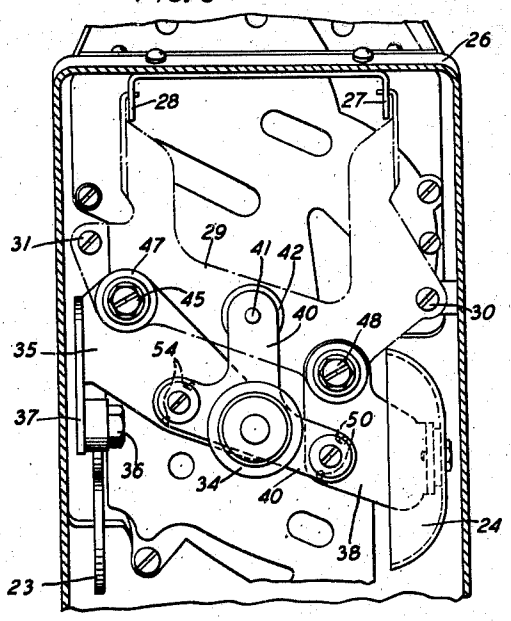

FIG. 10

FIG. 7.

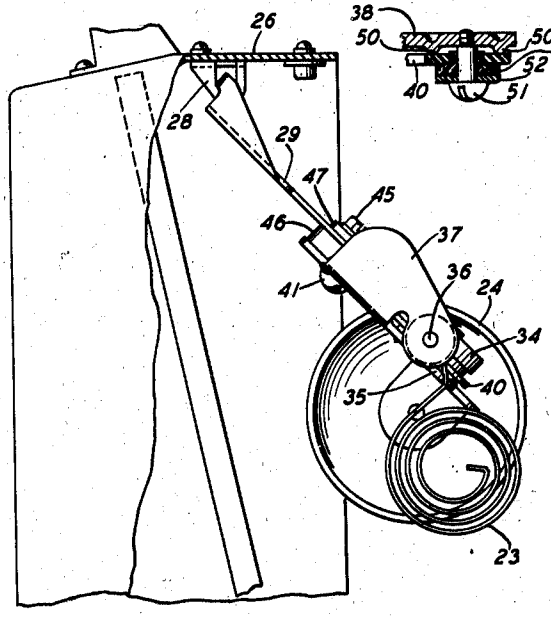

FIG. 9

FIG. 8

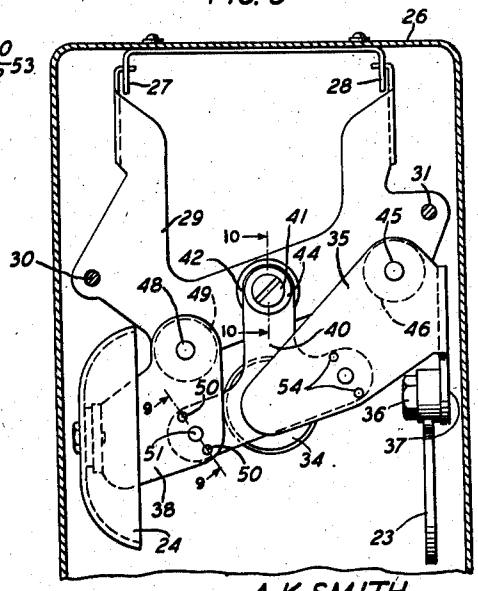

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FIG. 11

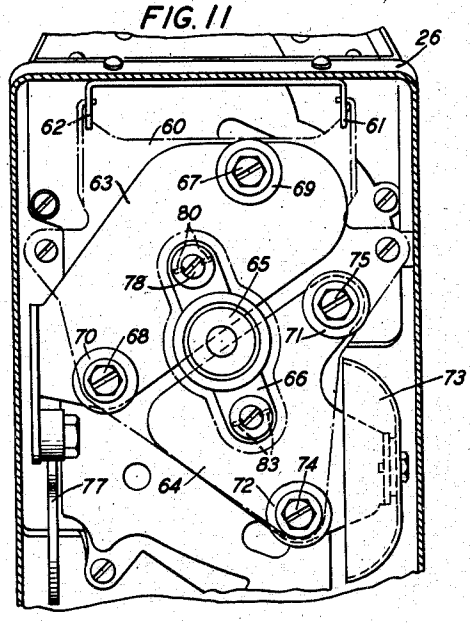


FIG. 12

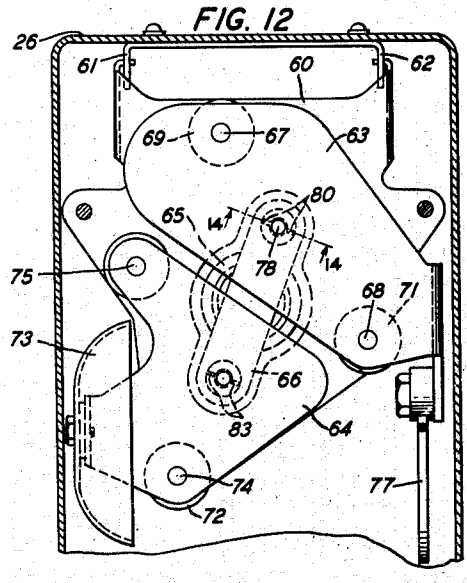


FIG. 13

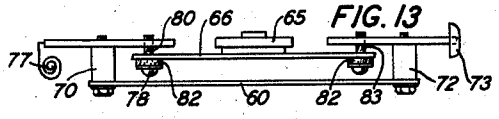


FIG. 15

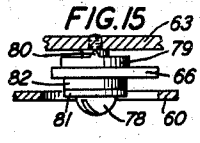


FIG. 14

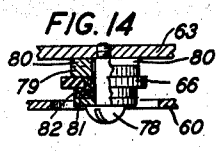


FIG. 16

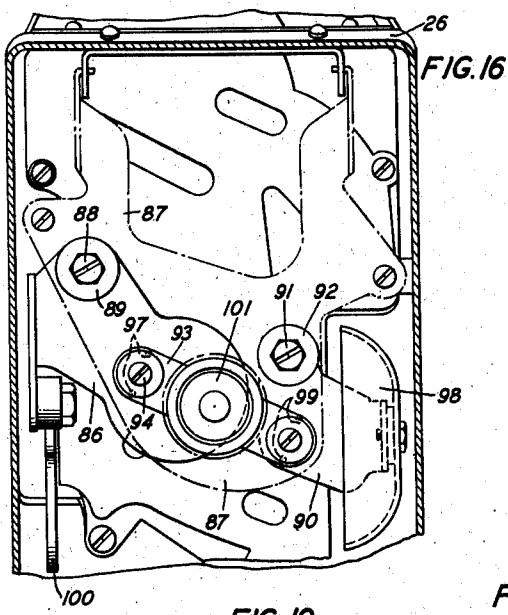


FIG. 17

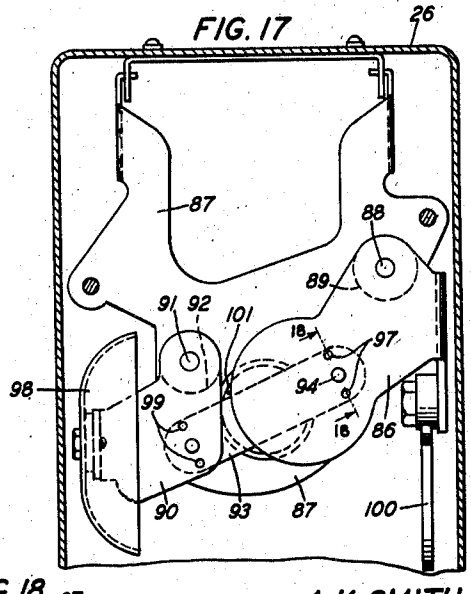


FIG. 19

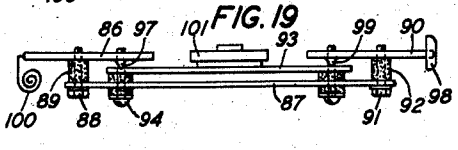
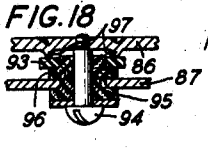


FIG. 18



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Patented Oct. 27, 1942

2,299,854

UNITED STATES PATENT OFFICE

2,299,854

TELEPHONE COIN COLLECTOR

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Application April 2, 1941, Serial No. 386,458

5 Claims. (Cl. 179—6.3)

This invention relates to telephone coin collectors, particularly of the handset type, and has for its primary object the provision in such a collector of means for selectively indicating to the remote central office the character and the number of coins deposited in payment for the use of the instrument.

In the usual type of coin collector the housing contains a multiple coin chute by means of which deposited coins are caused to strike distinctive sound signals which are in resonant connection with the talking transmitter mounted external to the housing. However, when a handset is used there is no resonant connection between the voice transmitter and the sound signals and it, therefore, becomes necessary to provide transmitter means within the housing responsive to the coin actuation of the signaling elements in order that the central office operator may be informed of the amount of money deposited.

In accordance with this invention a plurality of coin actuated signals are mounted within the collector housing in close association with a common pick-up transmitter in such a manner that the mechanical vibrations of each of the signals will be efficiently transmitted to the transmitter without inducing vibrations in the other signal in sufficient volume to cause interference with the transmission of the vibrations of the struck signal.

For illustrative purposes, the invention will be described as applied to a collector employing one gong for actuation by a coin of a first denomination and a second gong for actuation by a coin of a second denomination. The two gongs are preferably mounted within the collector housing on separate brackets and a single pick-up transmitter is mechanically coupled to both brackets by a flexible connection in such a manner that the vibrations of the active gong are fully effective on the transmitter but are prevented from being effectively transmitted to the passive gong. In one specific embodiment the transmitter is mounted on a plate with a pivotal type of flexible connection between the plate and each bracket, such as a knife-edge bearing between the plate and each bracket with resilient means for maintaining the plate in engagement with each bracket by means of this knife-edge coupling. When one of the gongs is struck by a coin the resulting vibration of its mounting bracket causes the transmitter plate to rock about the knife-edge coupling on the other bracket with little restraint to this rocking motion. This permits the passive gong bracket to remain practically free from the vibrations of the active gong bracket.

Referring to the drawings,

Fig. 1 is a general view of a handset coin collector;

Fig. 2 is a wiring diagram of a telephone coin collector substation;

Fig. 3 is a rear view in perspective of the upper housing of a telephone coin collector embodying the coin signal mounting arrangement of this invention;

Fig. 4 is a schematic view showing the coupling arrangements between the coin signal supporting brackets of Fig. 3;

Fig. 5 is a side view partly in section of the upper portion of the housing of Fig. 3;

Fig. 6 is a rear view partly in section of the upper housing of Fig. 5 with certain parts shown in broken lines;

Fig. 7 is a side view of the upper housing similar to Fig. 5 except that the sound signal arrangement has been moved about its pivoting axis to project partially outside the housing;

Fig. 8 illustrates a front view of the apparatus seen in Fig. 6;

Fig. 9 is a sectional view of one of the pivotal connections taken along the line 9—9 of Fig. 8;

Fig. 10 is a sectional view taken along the line 10—10 of Fig. 8;

Fig. 11 represents a rear view of a coin collector upper housing embodying an alternative form of this invention;

Fig. 12 is a front view of the apparatus of Fig. 11;

Fig. 13 is a schematic representation of the manner in which the coin signal brackets of Fig. 11 are mounted;

Fig. 14 is a sectional view of the transmitter plate mounting arrangement taken along the line 14—14 of Fig. 12;

Fig. 15 is a side view partly in section of the coupling arrangement of Fig. 14;

Fig. 16 is a rear view of a coin collector upper housing embodying this invention in a further modified form;

Fig. 17 is a front view of the apparatus of Fig. 16;

Fig. 18 is a sectional view of the transmitter plate mounting arrangement taken along the line 18—18 of Fig. 17; and

Fig. 19 is a schematic representation of the manner in which the coin signal brackets of Fig. 16 are mounted.

Fig. 1 is a general view of a telephone coin collector of the same general type as that dis-

closed in the O. F. Forsberg U. S. Patent 1,043,219, issued November 5, 1912, except that it is of the handset type requiring a special transmitter mounted inside the housing in resonant connection with the coin signals. The upper housing 20 has the usual coin gauge 21 in which the nickels, dimes and quarters may be deposited after which the coins pass through individual coin channels in a multicoin chute 22 whereby a deposited nickel strikes bell 24 once, a deposited dime strikes bell 24 twice and a deposited quarter strikes gong 23 once, after which the coins are directed into the usual coin hopper (not shown) for immediate collection or for subsequent collection or refund depending on whether the collector is of the prepay or postpay type. It is obvious that the voice transmitter 25 of the handset is not in resonant connection with the sound signals 23, 24 and the present invention is directed to a coupling arrangement between these sound signals and a special transmitter located within the upper housing whereby the coin actuated vibrations of either gong will be efficiently transmitted to this transmitter without the production of an interfering signal from the passive gong.

The top wall 26 of upper housing 20 has two downwardly directed lugs 27, 28 about which is pivoted a bracket 29 which acts as the primary support for the quarter gong 23, the nickel gong 24 and a pick-up transmitter 34 which is in resonant connection with both gongs. The swinging bracket 29 is normally held in a desired position with respect to the coin chute 22 by means of screws 30, 31 which hold the bracket 29 against suitable lugs projecting from the opposed inner walls of upper housing 20. The quarter gong 23 is rigidly fastened to a metal bracket 35 (Fig. 8) being mounted by a screw 36 to the bracket extension 37. Referring also to Fig. 8 it will be seen that the nickel gong 24 is rigidly fastened to one end of a separate metal bracket 38.

The pick-up transmitter 34 is rigidly mounted on a plate 40; and both brackets 35, 38 as well as plate 40 are independently and resiliently supported from the main swinging bracket 29 in a manner illustrated in Fig. 10 which specifically shows the connection between the swinging bracket 29 and the transmitter plate 40. Referring particularly to Fig. 10, plate 40 is coupled to swinging bracket 29 by a shouldered screw 41 which passes through an aperture in plate 40 into a threaded hole in bracket 29. Interposed between elements 29 and 40 is a soft rubber bushing 42 which has a neck portion separating screw 41 from the walls of the aperture in plate 40; and between plate 40 and the head of the screw is a soft rubber washer 43 and a metal washer 44. The quarter gong bracket 35 is similarly resiliently coupled to swinging bracket 29 by a screw 45 provided with a soft rubber bushing 46 between the two brackets and a soft rubber washer 47 between bracket 29 and the head of screw 45. In a similar manner the nickel gong bracket 38 is supported from swinging bracket 29 by a suitable screw 48 with a soft rubber bushing 49 interposed between the two brackets. Each of these couplings between swinging bracket 29 and the three vibratory elements 35, 38 and 40 is such that these couplings offer little or no resistance to the free vibration of any one of the elements 35, 38 or 40; or, stated in other words, there is practically no energy transfer between gong bracket 35 or gong bracket 38 and the swinging bracket 29; or between the swinging bracket 29 and the transmitter plate 40.

Transmitter plate 40 is also connected to each of the gong brackets 35, 38 by a resilient pivotal connection of which the connection with bracket 38 is illustrated in Fig. 9. Bracket 38 is threaded to receive a shouldered screw 51 which passes through an enlarged aperture in plate 40. Aligned with the center of screw 51 and rising from the surface of bracket 38 are two spaced conical shaped protrusions 50 which are held in engagement with the adjacent surface of plate 40. Between the metal washer 52 and plate 40 is a soft rubber bushing 53 which extends into the hole in plate 40 so that the only metal to metal contact between bracket 38 and plate 40 is by means of the two knobs 50. An identical type of coupling between transmitter plate 40 and the quarter gong bracket 35 is provided and hence will not be described in detail except that the corresponding protrusions or knobs on bracket 35 which are in resilient engagement with plate 40 are indicated by the reference character 54 in Fig. 8.

A somewhat schematic showing of the relationship of the various brackets to the transmitter plate 40 is shown in Fig. 4. As previously stated, the soft rubber bushings 42, 46 and 49 offer little restraint to the free vibration of brackets 40, 35 and 38, respectively. When the quarter gong 23 is struck by a deposited coin the resulting vibrations cause its bracket 35 to vibrate and the vibrations of bracket 35 are communicated to transmitter plate 40 through knobs 54 to induce corresponding vibrations in plate 40 and cause pick-up transmitter 34 to send a characteristic signal to the central office over the connecting line 56 to indicate coin deposit (see Fig. 2). If a rigid coupling existed between transmitter plate 40 and bracket 38 the above-described vibration of plate 40 would be transmitted through bracket 38 to set the nickel gong 24 into vibration, whose vibrations would be carried back to transmitter plate 40 to cause interference with the true signal and render it difficult to determine at the central office whether gong 24 or gong 23 had been struck by a deposited coin. However, the mounting arrangement of transmitter plate 40 is such as to avoid this type of interfering signal. When the quarter gong bracket 35 is set into vibration the transmitter plate 40 tends to rock about the knobs 50 as a pivot with the bushing 53 (see Fig. 9) having sufficient elasticity to permit this rocking movement whereby the amount of energy transferred to gong 24 is too small to induce vibrations in gong 24 of sufficient intensity to be transmitted back to plate 40 and cause any substantial interference with the true signal from gong 23.

Similarly when the nickel gong 24 is struck by a deposited coin its vibrations are transmitted through bracket 38 to plate 40 to cause the plate to rock about a pivoting axis defined by knobs 54 with substantially no mechanical energy being transmitted into bracket 35. The described arrangement, therefore, affords a direct resonant connection between the common pick-up transmitter 34 and each of the gong brackets by means of a pivotal type of connection between the transmitter and each bracket with the connection being of such flexibility that the vibrations freely picked up from either gong bracket are not substantially transmitted to the other gong bracket. The configurations of the two gong brackets 35, 38 are not particularly critical although they should possess sufficient stiffness

that each bracket vibrates as a unit when its associated gong is struck by a coin. The two brackets 35, 38 are preferably spaced from each other with their major portions lying in a common plane to facilitate the bridging of the two brackets by the transmitter plate 40. Pick-up transmitter 34 is preferably of the inertia type and substantially non-responsive to air-borne signals and, for example, may be of the type disclosed in the A. F. Bennett U. S. Patent 1,863,322, issued June 14, 1932.

A somewhat modified form of the invention is disclosed in Figs. 11 to 15, inclusive, wherein the swinging bracket 60 is pivotally supported about lugs 61, 62 and in turn supports the quarter gong bracket 63 and the nickel gong bracket 64. The pick-up transmitter 65 is mounted on a plate 66 which is coupled to both brackets 63, 64 but there is no direct connection between plate 66 and swinging bracket 60 as shown in the earlier figures. The two spaced screws 67, 68 serve to connect the quarter bracket 63 to the swinging bracket 60 in substantially the same manner as shown in Fig. 10 except that hard fibre bushings 69, 70 may be substituted for the soft rubber bushing 42 of Fig. 10. The two spaced screws 74, 75 serve to resiliently mount the nickel gong bracket 64 on the swinging bracket 60 in the same manner as shown in Fig. 10 with bushings 71, 72 preferably being of soft rubber, these rubber bushings serving to prevent the mechanical vibrations of one of the gong brackets from being transmitted to the other gong bracket by means of the common supporting bracket 60. When, for example, the nickel gong 73 is struck by a deposited coin the resulting vibrations in bracket 64 tend to vibrate the transmitter plate 66 about a pivot which forms a part of the coupling between plate 66 and the quarter bracket 63 while when the quarter gong 77 is struck by a deposited coin the resulting vibrations of bracket 63 tend to vibrate the transmitter plate 66 about a pivot forming a part of the coupling between plate 66 and the nickel bracket 64. The type of coupling between plate 66 and each gong bracket is illustrated in Figs. 14 and 15 which specifically show the coupling between plate 66 and gong bracket 63. A shouldered screw 78 passes through an enlarged aperture in plate 66 and is threaded into bracket 63. Between plate 66 and bracket 63 is a metal bushing 79 having a straight knife-edge 80 lying along a diameter of the bushing and in contact with the adjacent surface of bracket 63 on each side of the screw. Between the metal washer 81 and plate 66 is a soft rubber bushing 82 which has a neck portion entering the aperture in plate 66 to separate the screw 78 from the plate. This resilient coupling arrangement is viewed from another angle in Fig. 15 where the knife-edge lies perpendicular to the plane of the drawing instead of being parallel to the plane of the drawing as in Fig. 14. When the nickel gong bracket 64 is vibrated due to the coin actuation of gong 73 these vibrations in being transmitted to transmitter plate 66 tend to cause plate 66 to rock about knife-edge 80 as a pivoting axis. Similarly, when gong bracket 63 is vibrated due to the coin actuation of gong 77 these vibrations are transmitted to plate 66 to cause the plate to rock about the corresponding knife-edge 83 which forms the point of contact between plate 66 and bracket 64. The type of coupling just described enables the signal vibrations of either gong 77 or 73 to be efficiently transmitted to the pick-up transmitter 65 without the production of any interfering signal from the passive gong.

A further modified form of the invention is shown in Figs. 16 to 19 inclusive. The quarter gong bracket 86 is connected to the swinging bracket 87 by means of a screw 88 and a soft rubber bushing 89; while the nickel gong bracket 90 is connected to the swinging bracket 87 by means of a screw 91 and a soft rubber bushing 92 in substantially the same manner as shown in the sectional view of Fig. 10 of an earlier form of the invention. The pick-up transmitter plate 93 is resiliently coupled to the two gong brackets 86 and 90 and the swinging bracket 87 by an arrangement illustrated in Fig. 18 which specifically shows the coupling between brackets 86, 87 and transmitter plate 93. In Fig. 18 a shouldered metal screw 94 is shown passing through enlarged apertures in swinging bracket 87 and plate 93 and threaded into the gong bracket 86. The soft rubber bushing 95 serves as an elastic coupling between screw 94 and swinging bracket 87 while a second soft rubber bushing 96 serves as an elastic coupling between swinging bracket 87 and the transmitter plate 93. The gong bracket 86 has two conical-shaped protrusions 97 in engagement with the adjacent face of transmitter plate 93 to serve as a pivoting axis about which the transmitter plate 93 may vibrate when the other end of plate 93 is vibrated by the coin actuation of the nickel gong 90, while the soft rubber bushings 95, 96 serve to prevent any substantial transfer of this vibrational energy to the swinging bracket 87. The coupling arrangement between nickel bracket 90, transmitter plate 93 and swinging bracket 87 is similar to that disclosed in Fig. 18 whereby the coin actuation of the quarter gong 100 in transferring its vibrations through bracket 86 to transmitter plate 93 will cause plate 93 to rock about the knobs 99 as a pivoting axis without any substantial transfer of vibrational energy from transmitter plate 93 to either of the brackets 90 or 87.

What is claimed is:

1. In a coin collector housing, a multicoin chute for receiving coins of different denominations, a pair of plates, a separate coin signal mounted on each of said plates for selective actuation by coins traversing said chute, means for supporting each of said plates within said housing to permit the free vibration of each plate when its coin signal is actuated, said pair of plates being spaced from each other, a pick-up transmitter, and means for pivotally associating said transmitter with both of said plates whereby said transmitter responds freely to the vibrations set up in each plate by its associated signal while preventing any substantial transmission of these vibrations to the other plate.

2. In a coin collector housing, a multicoin chute for receiving coins of different denominations, a pair of stiff plates, a coin signal mounted on each of said plates for selective actuation by coins traversing said chute, resilient means for supporting each of said plates within said housing to permit the free vibration of each plate when its coin signal is actuated, said plates being spaced from each other with their adjacent portions lying substantially in a common plane, a third rigid plate bridging the gap between said adjacent portions and extending substantially beyond the adjacent boundaries of said pair of plates, resilient means for maintaining a pivotal engagement between said third plate and each of said pair of plates, and a pick-up transmitter

rigidly mounted on said third plate in a position intermediate said pivotal engagements.

3. In a coin collector housing, a multicoin chute mounted in said housing for receiving deposited coins of various denominations, a pair of brackets mounted in said housing, said brackets being spaced from each other and spaced from said chute, a gong mounted on one of said brackets and adapted to set said one bracket into vibration when the gong is struck by a deposited coin of one denomination, a second gong mounted on a second of said brackets and adapted to set said second bracket into vibration when said second gong is struck by a deposited coin of a different denomination, a third bracket bridging said pair of brackets and pivotally connected to each bracket of said pair, and a transmitter mounted on said third bracket.

4. In a coin collector housing, a multicoin chute mounted in said housing for receiving deposited coins of various denominations, a pair of brackets mounted in said housing, said brackets being spaced from each other and spaced from said chute, a gong mounted on one of said brackets and adapted to set said one bracket into vibration when the gong is struck by a deposited coin of one denomination, a second gong mounted on a second of said brackets and adapted to set said second bracket into vibration when said second gong is struck by a deposited coin of a different denomination, a third bracket, and means for providing a direct resonant connection between said third bracket and each of said first two brackets, said means comprising a knife-edge type of connection between said third bracket and each of said first two brackets.

5. In a coin collector housing, a multicoin chute for receiving deposited coins of various denominations, a pair of brackets mounted in said housing, said brackets being spaced from each other, a coin signal mounted on each of said brackets, a transmitter, a plate for supporting said transmitter, said plate and said brackets having overlapping portions, said plate being jointly supported by said brackets for receiving mechanical vibrations from each of said coin signals, said plate and the major portion of said brackets lying in substantially parallel planes, means for pivoting said plate about an axis intermediate the overlapping portions of said plate and said first bracket when said plate is vibrated by the coin actuated signal on said second bracket, and means for pivoting said plate about an axis intermediate the overlapping portions of said plate and said second bracket when said plate is vibrated by the coin actuated signal on said first bracket.

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