Dec. 24, 1946. G. R. FISH 2,412,978

MUSICAL CHIME CONSTRUCTION

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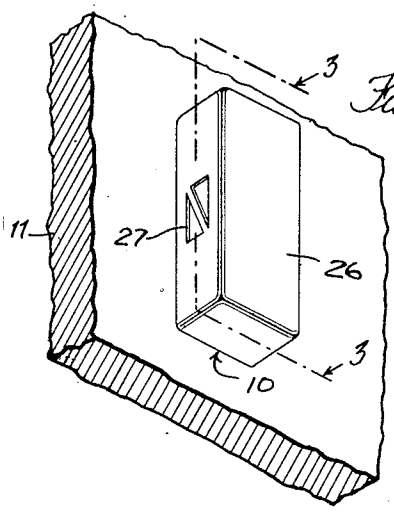


Fig. 1.

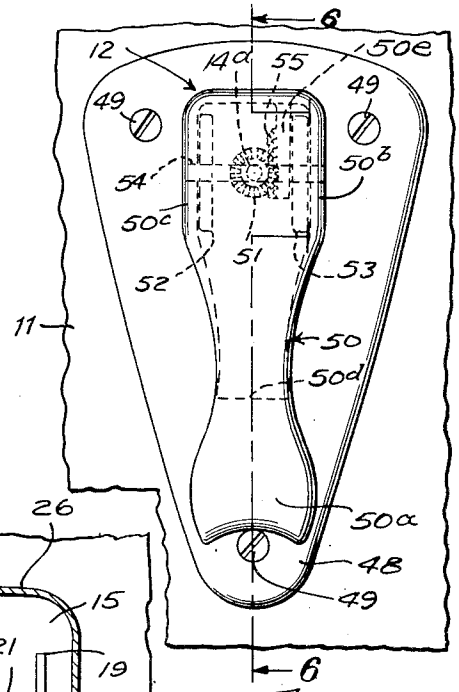


Fig. 2.

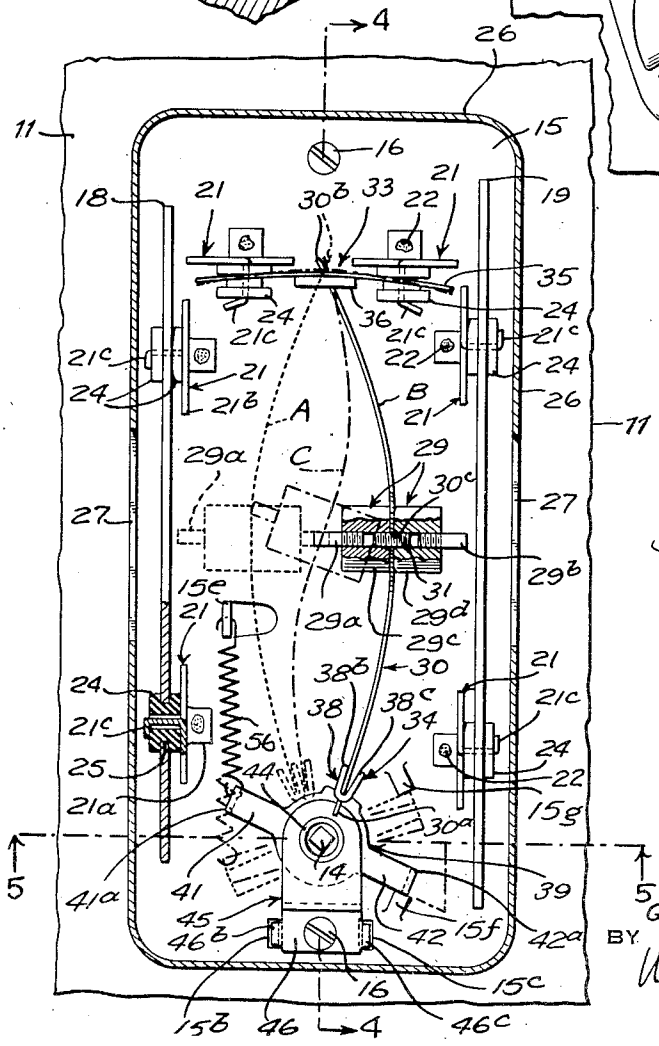


Fig. 3.

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Fig. 5.

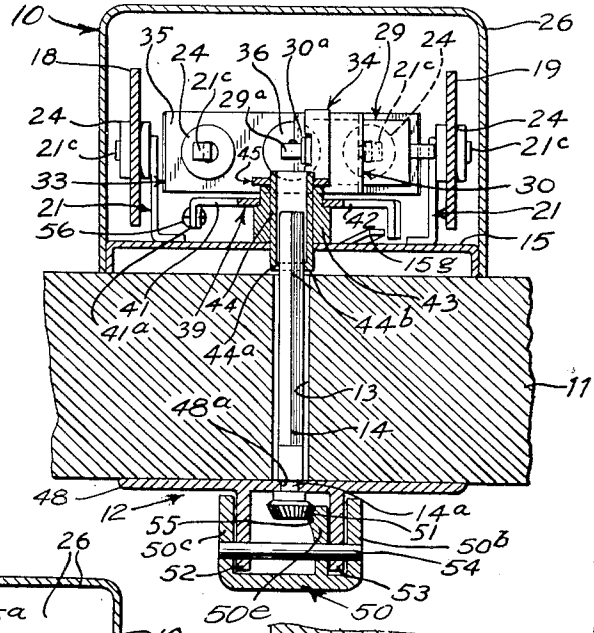


Fig. 4.

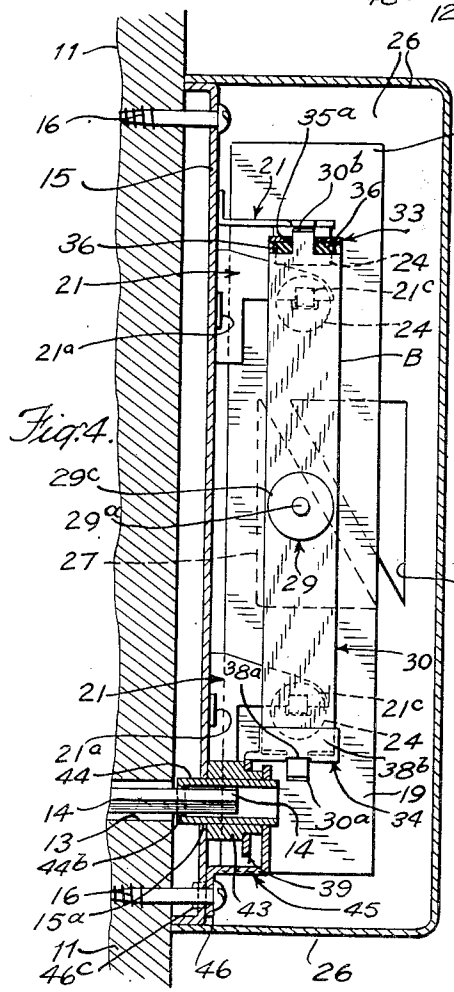
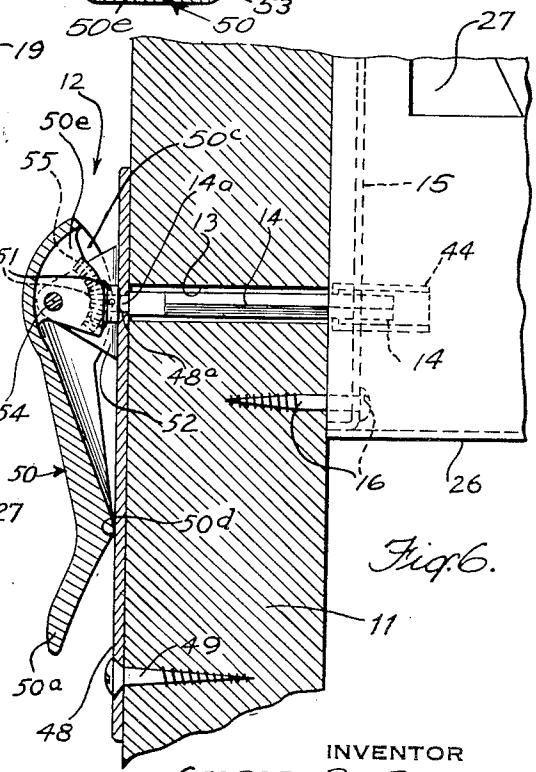


Fig. 6.



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MUSICAL CHIME CONSTRUCTION

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Application February 14, 1945, Serial No. 577,819

27 Claims. (Cl. 116—172)

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This invention relates to signalling devices, and more particularly to signals such as are employed at the front door of an apartment, or dwelling, or the like, and particularly to signalling devices that may sound one or more musical notes.

One of the objects of this invention is to provide a simple and practical signalling device of the abovementioned character which will be inexpensive to fabricate and which will be of reliable action in practical use. Another object is to provide a signalling device of the above-mentioned character which may be made up of individual, relatively simple parts so as, in turn, to facilitate manufacture of such parts individually and to so construct the latter as to facilitate rapid and dependable assembly. Another object is to provide an audible signalling device in which a sounding element may be set into vibration by mechanism which will be easy to assemble and which will require minimum adjustment or checking upon completion of assembly to achieve the intended sound emission. Another object is to carry out this last-mentioned object in the fabrication of an audible signalling device in which two sounding elements are to be successively struck and set into sound-emitting vibration. Another object is, in general, to improve the construction of audible signalling devices, particularly of the kind where two sounding elements are to be energized, and other objects will be in part obvious or in part pointed out hereinafter.

The invention, accordingly, consists in the features of construction, combinations of elements, and arrangements of parts as will be exemplified in the structure to be hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which is shown illustratively one of the various possible embodiments of this invention,

Fig. 1 is a small-scale perspective view of a signalling device as it appears when mounted in position on one side of a wall, or partition, or door panel;

Fig. 2 is a front elevation of an actuating mechanism as it appears when mounted on the other side of a wall, partition, door panel, or the like;

Fig. 3 is a vertical sectional view as seen along the line 3—3 of Fig. 1, certain of the internal parts being shown in elevation and certain others partially in section in order to show certain structural features more clearly;

Fig. 4 is a vertical central sectional view as seen along the line 4—4 of Fig. 3; and

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Fig. 5 is a transverse sectional view as seen along the line 5—5 of Fig. 3, while

Fig. 6 is a fragmentary transverse sectional view as seen along the line 6—6 of Fig. 2, showing certain details of the actuating mechanism of Fig. 2.

Similar reference characters refer to similar parts throughout the several views of the drawings.

The construction, mounting, and action of the device can best be illustrated if it is considered that the device is mounted on the front door of an apartment, dwelling, or the like, it being noted that door panels vary in thickness, and, hence, I preferably construct the device in the form of two units, one of which, conveniently termed the "signalling unit," and generally indicated in Fig. 1 by the reference character 10, is mounted upon the inside face of the door panel 11, and the other of which, conveniently termed the "actuating unit," and generally indicated in Figs. 2 and 5 by the reference character 12, is mounted on the outside face of the door panel 11, the latter requiring only the drilling of a hole 13 therethrough to permit free passage of an operating shaft 14 from the actuating unit on the outside to the signalling unit 10 on the inside face of the door.

The signalling unit comprises a base 15 preferably in the form of a sheet-metal stamping and peripherally flanged, as shown in Figs. 4 and 5, to give it strength and to rest against the inside face of the panel 11 to which it may be secured, as by screws 16. The base 15 is generally rectangular in shape, and adjacent its vertical edges—and, hence, laterally spaced from each other—are mounted two sounding elements 18 and 19 which can be of any suitable form or construction to emit suitable sound when set in vibration, and in the illustration, elements 18 and 19 may be in the form of rectangular metal plates—sometimes called "chime plates" or "bars"—and where they are to emit a different note, they are of correspondingly different dimensions, as indicated or suggested in the drawings. They are suitably supported, each preferably at two spaced points which preferably coincide with internodes, and the two supports for each bar preferably include a suitable yieldable material, such as soft rubber, felt, or the like, to minimize interference with sound-emitting vibration. Since the mountings are preferably identical in construction, it will suffice to describe only one of them in detail.

Thus I provide an L-shaped sheet-metal stamping 21, one leg or ear of which, 21a, rests flatwise against the base 15 to which it may be secured,

as by spot welding, indicated at 22, leaving an upstanding ear or leg 21b, which has cut and bent out of its plane a leg 21c bent over at its outer end, as is better shown in Fig. 3, thus to receive over the part 21c a washer 24 of rubber, felt, or the like, which, throughout its center or middle periphery, contains a groove into which the metal of the sounding element fits when, in the course of mounting, the yieldable washer 24 is thrust through a suitable hole 25 provided in the sounding element for that purpose.

Hence, as better appears from Figs. 3 and 5, the two sounding elements 18 and 19 are positioned in parallelism, each adjacent a vertical side edge of the base 16 and thus providing ample space between them in which to accommodate mechanism about to be described. Fitted over the entire assembly, and secured in any suitable way (not shown) to the base 16, is a box-like cover 26, which thus completes the enclosure of the sounding elements and related mechanism, and, due to suitable apertures 27 in the longitudinal side walls and positioned opposite the center portions of the sounding elements 18 and 19, the enclosure can, and does, function as a resonator to improve the quality of sound emitted by the sounding elements.

Preferably I provide for the successive striking of the two sounding elements 18 and 19, and a single cycle of operations may thus comprise the striking first of one and then of the other sounding element. To effect suitable impact of a sounding element, I provide a striker, generally indicated by the reference character 29, and provide it with two opposed striking elements 29a and 29b, which are preferably made of a suitable wood, and arrange for the actuation of striker 29 so that striker element 29a first impacts sounding element 18 and element 29b then impacts sounding element 19—each, however, in a manner to avoid damping of the vibrations of the struck sound element, even though the striker part or parts be made to come to rest. The striker 29 is actuated or carried by strained spring means adapted to assume either of two conditions and to undergo transition from one to the other with a snap-action, and preferably, and illustratively, the spring means takes the form of a flat or leaf spring 30, made of any suitable flat spring-steel; when made in flat or strip form, strip stock of spring material may be run through a simple punch-press operation to shape, pierce, and cut off the flat spring element 30 to give it tongues 30a and 30b at its respective ends and aligned along the longitudinal center line and to give it at its midpoint a hole 30c by which the mounting thereto of the striker part or parts may be effected.

The striker 29 preferably has some weight or mass to give it a suitable inertia when set into motion, and, hence, is preferably made of metal, conveniently in the form of two identical, cylindrical parts 29c and 29d, each of which has a threaded hole extending along its axis; these parts will be seen to be capable of easy and inexpensive manufacture, as by way of a screw machine.

The parts 29c and 29d are secured each to one side or face of the flat spring 30, and preferably in a manner to reinforce and strengthen the spring at its mid-point where the hole 30c is, and, conveniently, parts 29c and 29d are made to function as clamping elements to tightly clamp the midportion of the flat spring 30 between them, thus virtually precluding material flexing along a transverse line through the hole 30c where the spring 30 might otherwise be weakest. For this purpose I may employ a threaded headless stud or screw 31 which passes through the hole 30c in spring 30, and onto the ends projecting from either face of the spring 30 are threaded the parts 29c and 29d, each serving in effect as a nut for the other, thus clamping the midportion of the flat spring 30 flatwise between the adjacent flat faces of parts 29c and 29d, the diameter of which, as indicated in Fig. 4, may closely approximate the width of spring 30.

The threaded screw element 31 is of insufficient length (see Fig. 3) to fully occupy the threaded holes in the parts 29c and 29d, and into the unoccupied, opposite, end portions of these holes are threaded the striker elements 29a and 29b, which, if made of wood, need not be preliminarily threaded, since the threads of the parts 29c and 29d, in effect, cut threads into the shanks of the wooden striker elements and result in a tight or force fit. The striker elements 29a and 29b are thus dependably and securely mounted, one on each side of the flat spring 30, and substantially at its midpoint.

The flat spring 30 has its upper end, as seen in Figs. 3 and 4, supported in a resilient and yieldable mounting, generally indicated as a whole by the reference character 33, and has its lower end supported in a movable energy-transmitting mounting, generally indicated by the reference character 34, these mountings being constructed and spaced from each other in relation to the length of the flat spring 30 so that the latter, in an at-rest position, as shown in Fig. 3, is bowed and, hence, tends always to assume a straight-line shape, this latter tendency being utilized to hold the striker out of contact with its nearest sounding element. Spring 30, in thus trying to straighten out, effectively holds the striker element 29b out of engagement with sounding element 19, and, were it bowed in reverse direction by movement of the movable mounting 34, and allowed to assume the at-rest position, as indicated in the dotted lines A, the other striker element 29a is, by the same tendency of the spring 30 to assume a straight-line position, held out of contact with the other sounding element 18. These respective positions thus insure that neither sounding element is damped after being struck.

The elastic or resilient mounting 33 may be of any suitable construction that is capable of yielding upwardly, as viewed in Fig. 3, when the spring 30 goes through the transition from one bowed position (for example, the full-line position B) to, and beyond, and back to, the dotted-line position A, and vice versa. Illustratively, and conveniently, the mounting 33 comprises a flat spring 35, which may be of the same flat spring stock as is the spring 30, and it is suitably supported at its ends equally spaced from its midpoint, at which midpoint it has connection with the upper end of flat spring 30 to support the latter. Such connection conveniently comprises a slot 35a in the spring 35 large enough to receive, a bit loosely, the tongue 30b at the upper end of spring 30, and preferably the tongue 30b is of sufficient length to permit interposing between the mounting spring 35 and the portions of flat spring 30, to either side of the tongue 30b, of a washer 36 which is preferably non-metallic and preferably also is of any suitable yieldable damping mate-

rial, such as felt or rubber; it serves to aid the resilient action of the mounting spring 35 and makes for noiseless action as the flat spring 30 snaps from one bowed position to the other, and vice versa.

Mounting spring 35 is preferably also given a resilient support from the base 15 of the mechanism, and conveniently I employ two mountings, one at each end of spring 35, that are identical to the mountings or supports 21 that support each of the sounding elements 18 and 19 and are described above in detail, and, hence, these mountings or supports for spring 35 are identified by similar reference characters throughout. As mounting spring 35 partakes of different degrees of flexing throughout the action of the apparatus, the rubber washers or bushings 24, which extend through suitable holes adjacent the ends of the spring 35, yield appropriately, portions of them being normally under some degree of compression, and again the action is unhampered by friction-creating or noise-producing connections to the spring 35.

The movable mounting 34 comprises a socket to receive the lower end of spring 30 and, conveniently, is in the form of a U-shaped socket 38 which may be stamped out of sheet metal, being pierced, as at 38a, to provide a hole through which the tongue 30a of spring 30 projects, the other edge portion of spring 30 bottoming in the socket 38. The two side walls 38b and 38c of socket 38 may or may not, as desired, grip the spring 30 and preferably they are upwardly divergent, the parts 38b and 38c thereby forming in effect a two-armed fork of which they are the two arms, as indicated in Fig. 3, thus also facilitating assembly thereto of spring 30.

Mounting 34 and, hence, its socket 38 are arranged for movement, preferably in a reversible direction, so as to stress the spring 30 in a manner to cause it to snap from one bowed condition into reverse-bowed condition. For example, a transverse movement (as viewed in Fig. 3) or a rotary twisting movement applied to the lower end of the spring may be employed for this purpose, and in the illustrative embodiment I have shown an arrangement for utilizing both transverse motion of translation and a twisting motion as about a pivot; this I may achieve by causing the movement of socket 38 to take place along an arc of substantial radius.

Thus, the socket 38 may be secured to or formed integrally with a sheet-metal rocker 39 which is shaped or stamped to provide diametrically opposed arms 41 and 42 for a purpose later described, and suitable means are provided for rotatably supporting rocker 39, such as a hub 43, which may be at its right-hand end (Fig. 4) of reduced diameter to extend through a suitable hole in the rocker 39, the latter being rigidly secured thereto in any suitable manner, as by brazing, welding, or the like. Through the hub 43 extends a trunnion-forming member 44, preferably in the form of a tube, and secured thereto in any suitable way, as by a force fit, brazing, or the like. The tube 44 projects beyond the two ends of the hub 43, thus to provide trunnions, one of which is rotatably supported in a hole 15a in the base plate 15 and the other of which is rotatably supported in a hole in a bracket 45 shaped as shown in Figs. 3 and 4 and provided with a base portion 46 that rests flatwise against the base plate 15 and is secured thereto in any suitable way.

Preferably base plate 15 is provided with spaced holes 15b and 15c (Fig. 3) to receive ears 46b and 46c which are integral with the base portion 46 and bent rearwardly; these parts may thus function, after the hub 43 with its rocker 39 is assembled to the back plate 15 by inserting the left trunnion of tube 44 through the hole 15a, accurately to locate or position the bracket 45 as the latter is related to the right-hand trunnion of the tube 44, whence the base portion 46 is secured to the back plate 15, as by bending the ears 46b and 46c inwardly toward each other and against the rear face of the back plate 15. Preferably, also, one of the screws 16 that secures the device to the inside face of the panel 11, passes through registering holes in the base portion 46 and in the back plate 15 (see Figs. 3 and 4), thus making for better security of assembly and mounting.

The left end of trunnion tube 44 (Fig. 4) has an end wall 44a which has a square hole 44b to receive the operating shaft 14, which is also square in cross-section, thus forming a dependable driving connection therebetween so that rotary movement given the drive shaft 14 is transmitted to the rocker 39 and socket 38.

The actuating unit 12 (Figs. 2 and 5) may take any suitable form to give the shaft or rod 14 the desired rotary movement, and preferably it is constructed to simulate in appearance a "door knocker," and thus it may have a suitable escutcheon or base plate 48 secured to the panel 11, as by screws 49, and having pivotally mounted thereon a suitable arm or lever 50 provided with a finger or hand grip 50a of suitable configuration. The arm 50 may, therefore, be swung toward or away from the plate 48, and its movement about its pivot is arranged to be converted into rotary movement of the shaft 14.

Thus, for example, the square shaft or rod 14 (Fig. 5) may be turned down, as at 14a, to provide a trunnion which is rotatably supported in a hole 48a in the base plate 48, and to the projecting portion of the trunnion 14a is secured, as by a pin (not shown), a miter or bevel gear 51, the gear 51 and the shoulder at the righthand end of trunnion 14a holding the rod 14 assembled to the base plate 48 and holding it against axial displacement.

Projecting from the base plate 48, and integrally formed therewith, are two spaced ears or lugs 52 and 53, provided with holes to take a pivot pin or screw 54, and the under side of the upper end of the arm 50 is shaped, as by casting, stamping, milling, or the like, to provide two spaced ears 50b and 50c, also having holes therein for the pin 54, and between which are the ears 52 and 53 of the base plate 48, thus completing the pivotal connection between the parts 50 and 48.

On the inside face of arm 50 is an ear 50e on which is secured or formed a curved rack or gear segment 55, coaxially with the axis of pivoting, that axis being preferably positioned to intersect the axis of the gear 51 with which the gear segment 55 meshes. Ear 50e has a hole in it for the passage therethrough of pivot pin 54 (Fig. 5).

Preferably the extent of pivoting of arm 50 relative to base plate 48 is limited, in counterclockwise direction, by a suitably inwardly projecting part 50d of the arm 50, and, in clockwise direction, by the upper end portion 50e, these parts coming into engagement with the mount-

ing plate 48 according to the direction in which the arm 50 is swung.

The ratio of drive between segment 55 and gear 51 is such that the desired amount of limited swing of member 50 gives the shaft 14, and hence the rocker 39, a sufficient swing, illustratively, on the order of 60 degrees, to shift the movable support 34 to effect transition of the spring 30 from one bowed condition to a condition in which the bowing is reversed, as is later described. Preferably provision is made to effect return swing of the actuating arm 50 upon completion of its manual movement in one direction throughout its limited range, and for this purpose I preferably employ a spring 56 (Fig. 3), one end of which is connected to rocker arm 41, which may be bent inwardly, as at 41a, for that purpose, and the other end of which is anchored to a lug 15e that is struck up out of the back plate 15. Spring 56 is normally under tension to hold rocker 39 in the full-line position shown in Fig. 3, and, through the shaft 14 and the gearing 51 and 55, spring 56 thus holds the actuating lever 50 (Fig. 5) in the position shown, and thus part 50d can function to limit the extent to which spring 56 (Fig. 3) can swing the rocker 39 in clockwise direction. This action may be supplemented by a lug 15f struck up out of the back plate 15 and positioned to be engaged by the lug 42a which is formed by bending a portion of the rocker arm 42 rearwardly.

Swinging of the actuating lever 50 (Fig. 5) in clockwise direction to the extent limited by the part 50e thus can give the rocker 39 the maximum amount of swing in counter-clockwise direction (Fig. 3), thus to swing the combined fork-like arms 38b and 38c and socket support 38 from the right-hand side of the axis of rocker 39 to the left-hand side thereof, and thus, also, further tensioning, or storing energy in, the spring 56, so that release of the actuating lever 50 permits the spring 56 to expend its stored energy and restore the parts to normal or starting position.

Companion to the lug 15f is a lug 15g, also formed by striking up a portion of the metal of the back plate 15, and spaced about 60 degrees from the lug 15f. These lugs 15f and 15g serve to facilitate assembly of the mechanism in course of fabrication and to prevent disarrangement of the parts during shipment and also during the steps of assembling the actuating unit and the signalling unit to the respective sides of the door panel and to each other. For example, the lug 15f prevents the spring 56 from continuing rotary movement of the rocker 39 and socket 38 in clockwise direction to an extent that can withdraw the upper end tongue 30b from its retaining resilient support; with both lugs 15f and 15g, also, the flat spring 30, with its striker 29, may be assembled to both of its end supports, whether or not spring 56 is first put in position, for unintentional or accidental rotary movement of rocker 39 in either direction and sufficient to cause withdrawal of the upper end of the spring from its mounting cannot, therefore, take place. Also, these relationships facilitate assembly of the shaft 14 from the other side of the door panel to the bearing and driving shaft 44, for the square hole in the latter is thereby held in proper relation to receive the square shaft when the lever 50 is in its starting or normal position. Where the door panel 11 is thinner than that shown, the driving connection between the square shaft 14 and the driving tube 44 is still maintained, the two parts being telescopically related and any surplus length of shaft projects into the bearing tube 44 and may project beyond that to the extent of the front wall of the cover 26.

Because of the tendency of the flat spring 30 to straighten out (Fig. 3), its lower end portion engages the wall 38b of the socket 38 and tends to apply a turning torque in counter-clockwise direction to the rocker 39, against the tension of the spring 56, and its upper end exerts force against the flat spring 35, tending to bow it, the various parts assuming the full-line position shown in Fig. 3. As the rocker 39 is swung counter-clockwise by the drive shaft 14, the right-hand wall 38c of socket 38 is pivoted into engagement with the lower portion of spring 30, that lower end of the spring also moving upwardly and to the left in an arc, thus shortening the distance between the end supports of spring 30 and also bowing the upper supporting spring 35 still more, and, in effect, storing energy in both spring 30 and spring 35. Shortly after the socket 38 passes to the left of dead-center, spring 30 assumes a shape somewhat as indicated in broken line C, whence the energy stored in the two springs 30 and 35 is about ready to be released, spring 30 quickly snapping into the bowed shape indicated at A, whence, aided by the inertia or energy of movement of the relatively heavy striker 29 and aided by the tendency of supporting spring 35 to straighten out, the spring 30 is bowed to the left beyond the position A and the striker element 29a is, with substantial velocity, impacted against the sounding element 18—all before the rocker arm 42 reaches the lug 15g. This speedy bowing beyond the position A is facilitated by the leeway allowed between the fork-like arms 38b and 38c of the socket 38, the right-hand arm 38c being in a "pushing" contact with the lower portion of spring 30. Having struck the sounding element 18, the striker 29 starts a rebound, aided by the tendency of spring 30 to again straighten out, and which tendency always acts in a direction to hold the striker away from the sounding element, or vice versa, so that damping of its vibrations does not take place.

Should the actuating lever 50 be released upon the completion, or just prior to the completion, of its clockwise stroke, the energy stored in the spring 56 commences a reverse rotary movement of rocker 39 and also of drive shaft 14, and hence commences a return drive of the actuating lever 50 to normal or starting position; the socket support 38 now swings upwardly and to the right in an arc to start the bowing of the spring 30 in reverse direction, that is, from the shape or position A to the shape or position B. During this action, the left-hand arm 38b is in "pushing" contact with the lower portion of the spring 30. Just prior to the rocker arm 42 reaching the lug 15f, and somewhat after the socket 38 has passed over dead-center, the spring 30, aided by the straightening-out tendency of support spring 35, snaps into a bowed shape beyond (to the right) the full-line position B, aided by the energy of movement or inertia communicated to the relatively heavy striker 29, thus giving the other sounding element 19 a high velocity or sharp blow from which the striker rebounds, aided in the rebound by the tendency of spring 30 to assume a straight-line relation. Under the effect of spring 56, rocker arm 42 thereafter and ultimately reaches the lug 15f, as does also the part 50d of the actuating lever 50 reach the mounting plate 48 of the actuating unit.

It will be seen that the parts are so proportioned and interrelated that the spring 30, disregarding for the moment the effect of spring 56, assumes a normal bowed position, either A or B, in which the striker falls short of engagement with a sounding element and in which the tendency of the spring 30 itself, through either wall portion 38b or wall portion 38c of socket 38, controls or determines the corresponding rotary position of the rocker 39, and thus damping action on the chime bars is dependably precluded; the spring 30, in either position A or B, thus coacts, due to the kind of connection it has with the rocker 39, with either wall 38c or 38b to limit its own bowing beyond these respective positions, excepting as the momentum of the striker and the follow-up action of spring 33 carries the bowing of the spring beyond either of these positions for the purpose of striking a sounding element, the rebound, plus the yielding of the spring 33 and the yielding connection therewith of the upper end of the spring 30, insuring quick withdrawal of the striker from the stricken vibrating element so as not to damp its vibration. Thus dependable musical action may be achieved.

The construction will be seen to be simple and inexpensive to fabricate and simple and easy to install, the actuating unit being easily mounted on the outside of the partition or panel 11 and the signalling unit being readily mounted on the opposite face, interconnection being effected through the shaft 14 of the actuating unit which passes through a hole 13 easily drilled through the partition (Fig. 5); as better appear in Figs. 4 and 5, the apparatus will be seen to be readily accommodated to panels or partitions of different thicknesses, the telescopic relation between the shaft 14 and the part 44 permitting wide variation of the spacing between the two units, and the space to the right (in Fig. 4) of the sleeve 44 being unobstructed so that a substantial portion of the shaft 14 may project thereinto in the event that the panel 11 is very thin.

It will thus be seen that there has been provided in this invention a signalling device in which the various objects above noted, together with many thoroughly practical advantages, are successfully achieved.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. A signalling device having spaced sounding elements, striker means therefor, means mounting said striker means between said sounding elements for movement in directions first to strike one element and then the other, said mounting means comprising a flat spring supporting said striker means substantially at its midpoint and two spaced mountings supporting said spring at its ends and spaced apart by a distance shorter than the length of the spring whereby the spring is bowed, and a rocker carrying one of said mountings to move it and the spring end supported by it substantially in an arc and thereby increase the bowing of the spring and flex the end of the spring in a direction to reverse its bowed position and cause said striker means to be suddenly impacted against a sounding element.

2. A signalling device as claimed in claim 1, in which the mounting for the other end of the flat spring comprises resilient means that yields upon said rocker being actuated in a direction to increase the bowing of the spring and thereby has energy stored in it whereby said resilient means adds force to the impact of said striker means.

3. A signalling device as claimed in claim 1, in which the mounting carried by said rocker has a mechanical, reversibly-acting connection with the end of the spring supported thereby whereby either may transmit turning torque to the other, the transmission of turning torque by the rocker to the spring end being effective to flex the spring end as aforesaid, and the spring, upon completion of the impact, assumes a bowed at-rest position and said connection acts to tend to hold said rocker in a position dependent upon the bend in the spring due to said at-rest bowed position.

4. A signalling device as claimed in claim 1, in which one of said mountings for the spring ends comprises socket-like means providing at least two spaced elements between which the spring end is received.

5. A signalling device as claimed in claim 1, in which the spring ends and said mountings therefor have respective coacting parts forming detachable connections.

6. A device as claimed in claim 1, in which the mounting carried by said rocker comprises two elements spaced apart by a distance greater than the thickness of the spring end for engagement therewith, respectively, at the beginning and end of a working stroke of said rocker.

7. A signalling device as claimed in claim 1, in which the mounting for the other end of the said spring comprises cushioning means and spring means supporting said cushioning means and yieldable as said rocker operates upon said spring.

8. A signalling device having spaced sounding elements, striker means therefor, means mounting said striker means between said sounding elements for movement in directions first to strike one element and then the other, said mounting means comprising a flat spring supporting said striker means substantially at its midpoint and two spaced mountings supporting said spring at its ends and spaced apart by a distance shorter than the length of the spring whereby the spring is bowed in a direction to position the striker adjacent to but out of contact with one of said sounding elements, and reversibly-acting means operating upon one of said spring end mountings to flex the spring end supported thereby in opposite direction and thereby reverse the bowing of the spring and effect impact of said striker means against the other sounding element.

9. A signalling device having spaced sounding elements, striker means therefor, means mounting said striker means between said sounding elements for movement in directions first to strike one element and then the other, said mounting means comprising a flat spring supporting said striker means substantially at its m dpoint and two spaced mountings supporting said spring at its ends and spaced apart by a distance shorter than the length of the spring whereby the spring is bowed in a direction to position the striker means at one of said sounding elements and spaced away from the other, and reversibly-acting means operating upon one of said mountings to move it in a direction to stress said spring to reverse its bowed position with substantially a snap action and thereby impact said other sounding element.

10. A signalling device comprising two spaced

sounding elements, a bowed spring having spaced supports by which said spring is supported in bowed condition, reversibly-acting means coacting with said spring and adapted upon actuation to reverse the bowing of the spring, and striker means actuated by said spring and, in response to reversals in bowing thereof, to impact said sounding elements.

11. A signalling device comprising a sounding element, a flat spring carrying a striker substantially at its midpoint, two spaced supports for the ends of said spring, one of which supports comprises two spaced members between which the spring end is received, and means mounting said one support for reversible movement in substantially an arc and thereby vary the distance of said support from the other support, said spring being bowed either toward or away from said sounding element according to the direction of movement of said one support along said arc and coacting through said spaced members to substantially limit movement of said one support along said arc.

12. A signalling device comprising a sounding element, a flat spring carrying a striker substantially at its midpoint, two spaced supports for the ends of said spring, one of which supports comprises two spaced members between which the spring end is received, means mounting said one support for reversible movement in substantially an arc and thereby vary the distance of said support from the other support, said spring being bowed either toward or away from said sounding element according to the direction of movement of said one support along said arc and coacting through said spaced members to substantially limit movement of said one support along said arc, the length of said spring and the spacing between said supports when the spring is bowed toward the sounding element being proportioned so that said striker is adjacent said sounding element but out of contact therewith, and means whereby, when said movable support effects transition of said spring to bow it toward the sounding element, said striker is carried beyond said out-of-contact position to impact the sounding element and immediately after impact assumes said out-of-contact position.

13. A signalling device as claimed in claim 12, in which said last-mentioned means comprises means resiliently mounting one of the supports of said spring whereby said support follows up the spring end supported by it when the spring bows beyond said out-of-contact position in impacting said sounding element.

14. A signalling device as claimed in claim 12, in which said last-mentioned means comprises means of substantial weight carried substantially at the midpoint of said spring to be given sufficient inertia to bow the spring beyond said out-of-contact position on the impacting stroke of the striker.

15. A signalling device comprising a sounding element, a bowed spring having spaced supports by which said spring is supported in bowed condition, means for applying force to said spring to cause it to reverse its direction of bowing, and striker means actuated by said spring to strike said sounding element.

16. A signalling device comprising two spaced sounding elements, a spring capable of being reversibly bowed, spaced supports by which said spring is supported in bowed condition, one of said supports having resilient means mounting it for yieldable movement toward or away from the other support, reversible means coacting upon actuation to reverse the bowing of the spring, and striker means operating in response to reversals in bowing of said spring to impact said sounding elements.

17. A signalling device comprising two spaced sounding elements, a spring capable of being reversibly bowed, spaced supports by which said spring is supported in bowed condition, means operating upon said spring through one of said supports to strain the spring to effect reversal of its bowing, and striker means inpacting said sounding elements in response to reversals in bowing of said spring.

18. A signalling device comprising two spaced sounding elements, a spring capable of being reversibly bowed, spaced supports by which said spring is supported in bowed condition, one of said supports being movable and being constructed and operating in response to movement thereof to apply a flexing force to the spring, means mounting said movable support for movement in successive reversed strokes, and striker means impacting said sounding elements in response to bowing of said spring.

19. A signalling device for mounting on a panel, wall, or the like, comprising a signalling unit adapted to be mounted on one face of the panel and having a sounding element and striker means therefor and means including a rotary element for actuating said striker means, and an actuating unit adapted to be mounted on the other side of the panel and comprising a support having pivotally mounted thereon a lever for movement toward or away from the support, a rotary shaft having a bearing in said support and extending rearwardly therefrom and adapted to pass through a hole in said panel for coaction with said rotary element, said shaft having a gear-like member exposed between said base and said lever and said lever having a rack for actuating said gear-like member.

20. A signalling device having spaced sounding elements, striker means therefor, means mounting said striker means between said sounding elements for movement in directions first to strike one element and then the other, said mounting means comprising a flat spring supporting said striker means substantially at its midpoint and two spaced mountings supporting said spring at its ends and spaced apart by a distance shorter than the length of the spring whereby the spring is bowed in a direction to position the striker means at one of said sounding elements and spaced away from the other, and means reversibly moveable in a direction substantially transverse to a line connecting said two spaced mountings for applying force to said spring to stress the spring to reverse its bowed position with substantially a snap action and thereby impact said other sounding element.

21. A signalling device comprising two spaced sounding elements, a bowed spring having spaced supports by which said spring is supported in bowed condition, means reversibly moveable in a direction substantially transversely of a line joining said spaced supports for stressing said spring out of its bowed condition and thereby reverse the bowing of said spring, and striker means actuated by said spring and, in response to reversals in bowing thereof, to impact said sounding elements.

22. A signalling device comprising two spaced sounding elements, a bowed spring having spaced supports by which said spring is supported in

bowed condition, a reversibly actuatable rocker having two spaced elements alternatively engageable with said spring to stress it out of bowed condition and thereby reverse the bowing of the spring, and striker means actuated by said spring, and, in response to reversals in bowing thereof, to impact said sounding elements.

23. A signalling device comprising two spaced sounding elements, a bowed spring having spaced supports by which said spring is supported in bowed condition, a member for applying force to the convex side of the bowed spring to strain the spring to assume a reversed bowed condition, a member for applying force to the convex side of the spring when in reverse bowed condition to strain the spring to assume its initial bowed condition, means moveably mounting said two members and for actuating them successively in spring-straining direction, and striker means actuated by said spring and, in response to reversals in bowing thereof, to impact said sounding elements.

24. A signalling device as claimed in claim 16 in which said reversible means comprises means for applying, at spaced points lengthwise of said spring, forces acting in substantially opposite directions to thereby twist the spring in a direction to reverse its bowed condition.

25. A signalling device comprising two spaced sounding elements, a spring capable of being reversibly bowed, spaced supports by which said spring is supported in bowed condition, one of said supports having resilient means mounting it for yieldable movement toward or away from the other support, reversible means coacting upon actuation to apply force to the bowed spring on the convex side thereof to stress it to reverse the bowing of the spring, and striker means operating in response to reversals in bowing of said spring to impact said sounding elements.

26. A signalling device as claimed in claim 15 in which said force-applying means comprises means for applying a spring-flexing force to the spring to flex it in a direction to reverse its direction of bowing with a snap action and means operating to apply a force of compression to the spring in the direction of its length to increase the snap action with which the spring reverses its direction of bowing.

27. A signalling device as claimed in claim 15 in which said force-applying means comprises a fork-like means having two spaced arms between which said spring extends and means movably mounting said fork-like means for movement in reversible strokes in a direction substantially transversely of a line joining said spaced supports for effecting successive reversals in the direction of bowing of said spring.

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