June 13, 1961

F. H. MAGNUS

2,987,949

CHORD TYPE REED ORGAN

Filed Oct. 15, 1958

4 Sheets-Sheet 1

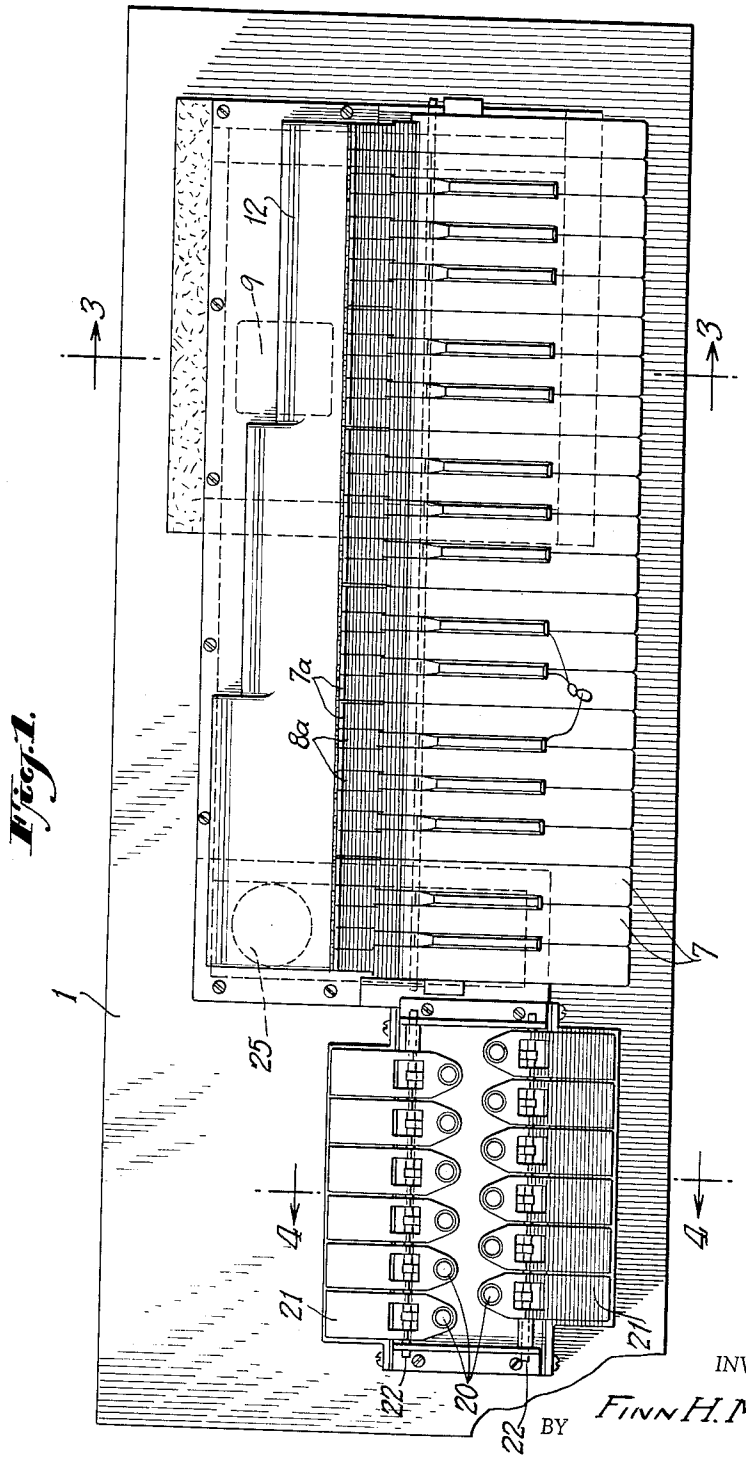

Fig. 1.

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4 Sheets-Sheet 2

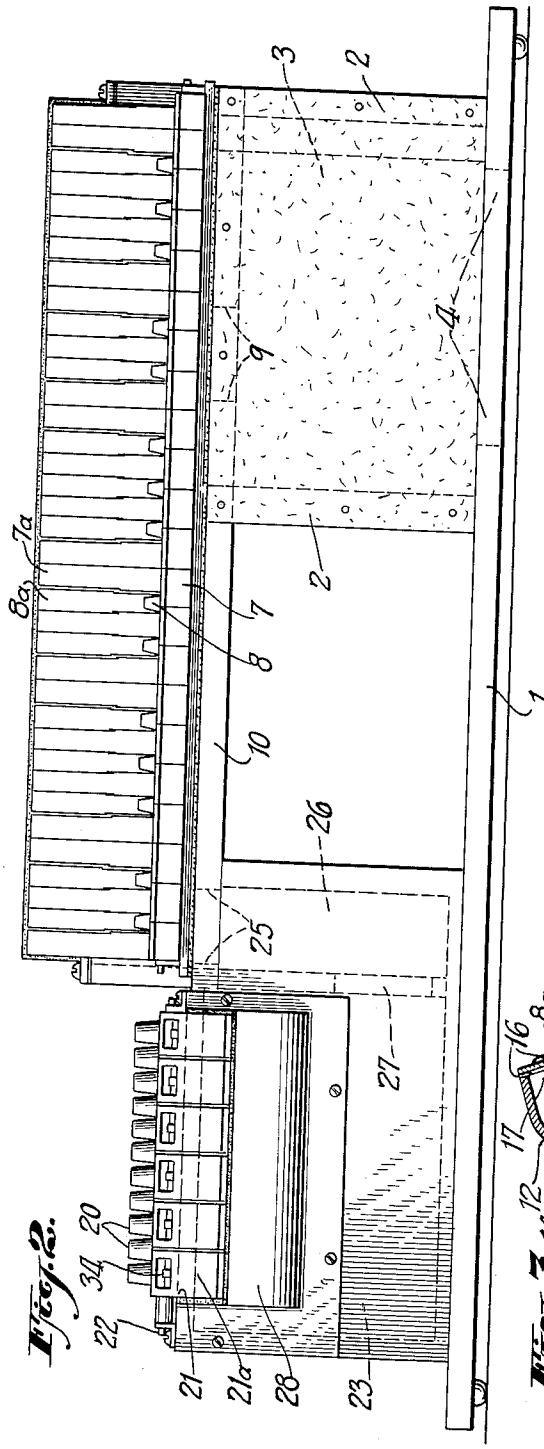

Fig. 2.

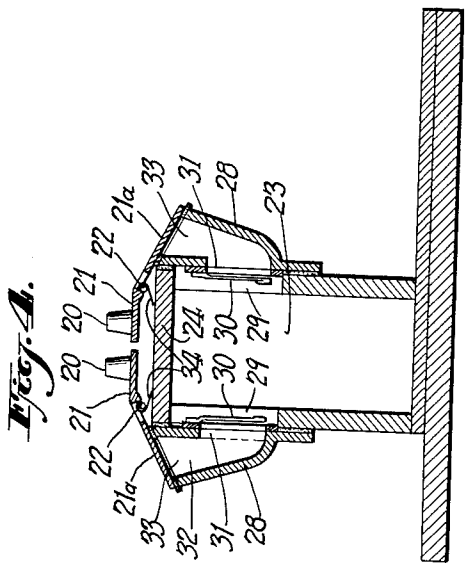

Fig. 4.

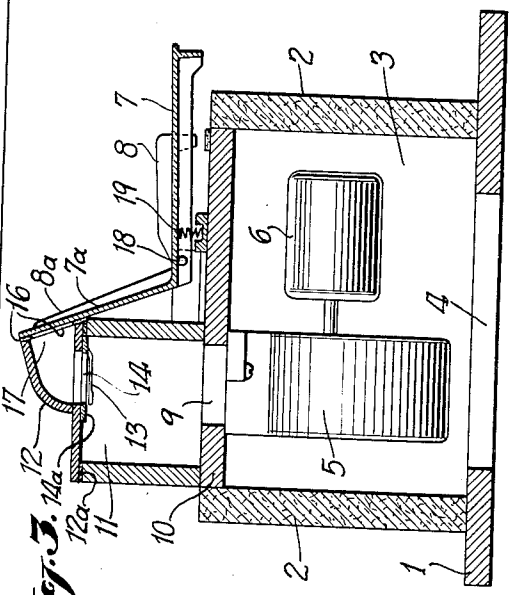

Fig. 3.

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4 Sheets-Sheet 3

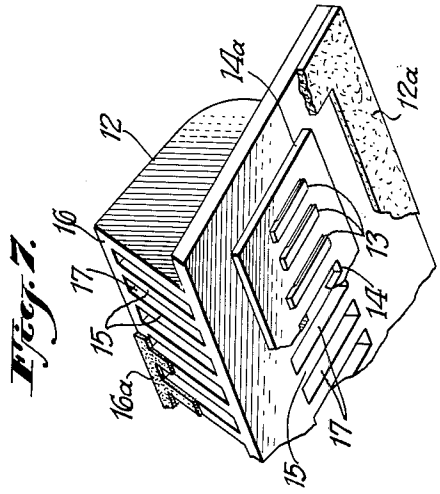

Fig. 7.

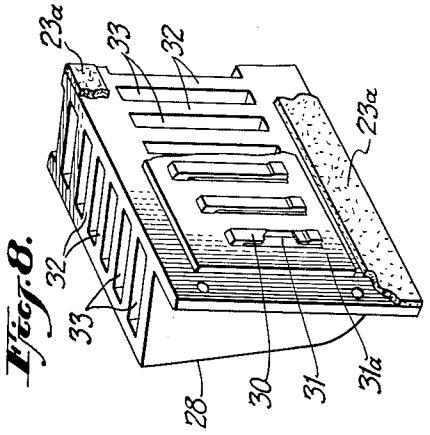

Fig. 8.

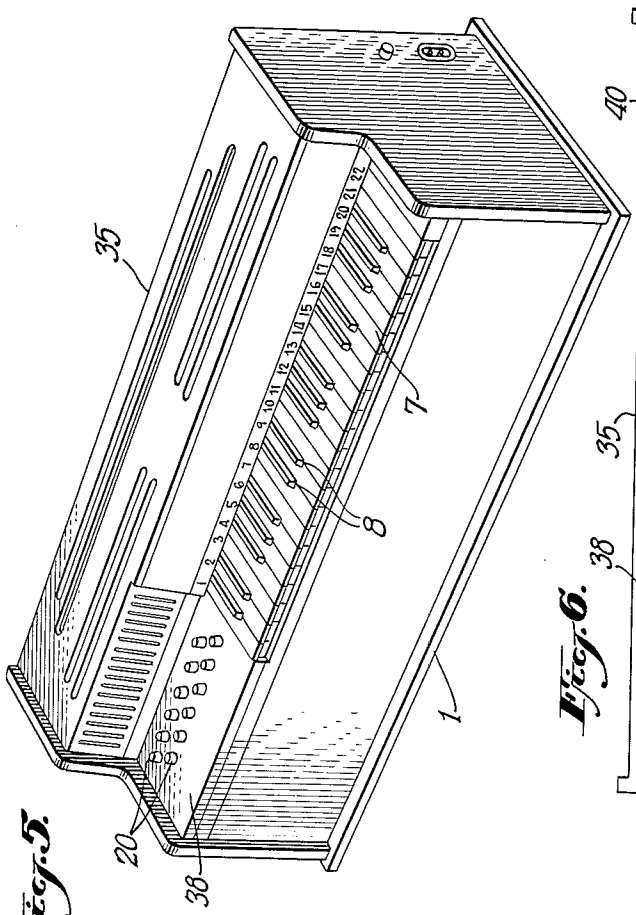

Fig. 5.

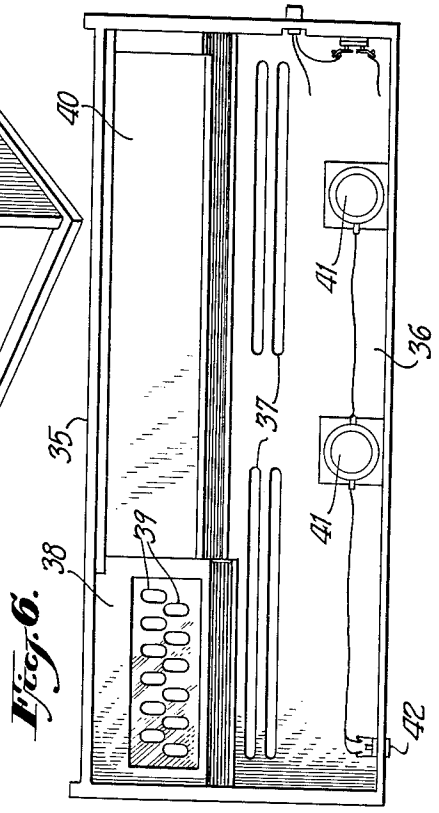

Fig. 6.

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CHORD TYPE REED ORGAN

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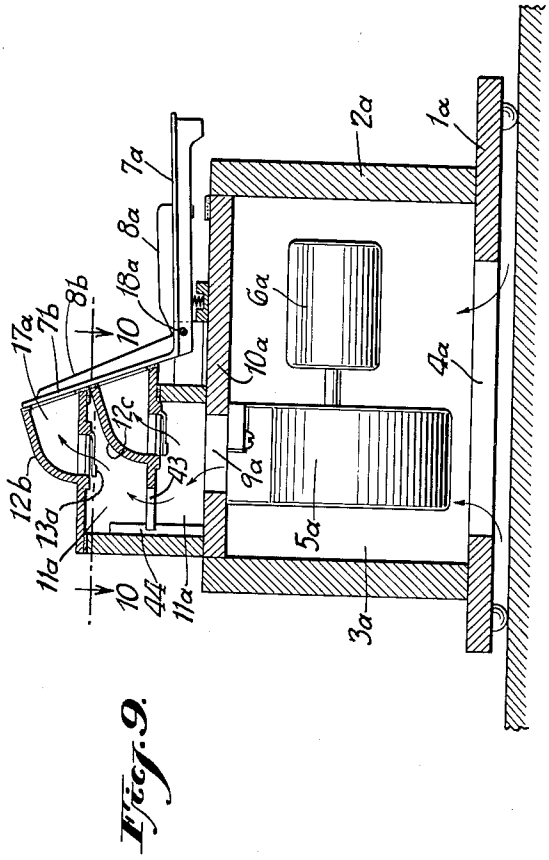

Fig. 9.

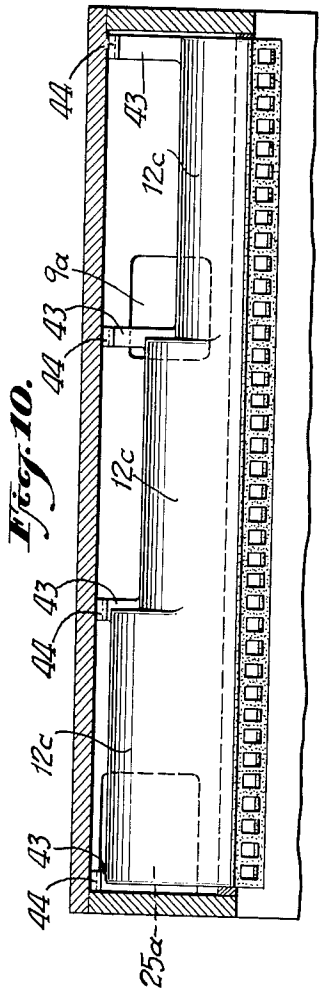

Fig. 10.

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2,987,949

CHORD TYPE REED ORGAN

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Filed Oct. 15, 1958, Ser. No. 767,331
3 Claims. (Cl. 84—351)

The invention in one of its aspects relates to a reed organ of the chord type—i.e. having one keyboard of the piano type and a second keyboard by which selected accompanying chords may be played, wherein the supply of air under pressure to the respective keyboards is so arranged and proportioned that the background sounds as produced by the chords will be lower or softer than the treble sounds as produced by the piano type keyboard. In this aspect the invention involves the provision of separate pressure chambers serving respectively the reeds associated with the two keyboards, and a restricted passageway communicating between the two pressure chambers, in combination with a source of air under pressure from which the air first passes to the pressure chamber serving the piano type keyboard, and then through the restricted passageway to the chamber serving the chord type keyboard. In this aspect the invention also involves the structural coordination of the above mentioned main components of the organ in an efficient and compact manner compatible with the requirements of such an organ in respect to minimum displacement, portability, and convenient access to the operating parts.

In other auxiliary aspects the invention pertains to the mountings of the keys constituting the respective keyboards and their structural coordination with the reeds and pressure chambers respectively serving such keyboards; and also to certain provisions promoting efficient electronic amplification of the music when desired. Further objects and advantages of the invention will be in part obvious and in part specifically referred to in the description hereinafter contained which taken in conjunction with the accompanying drawings, discloses the invention as embodied in an organ of preferred construction; the disclosure however should be considered as merely illustrative of the invention in its broader aspects. In the drawings:

FIGS. 1 and 2 are respectively a plan view and a front elevation of the organ with its outer enclosing casing removed.

FIGS. 3 and 4 are sectional views taken respectively on the lines 3—3 and 4—4 of FIG. 1, looking in the direction of the arrows.

FIG. 5 is a perspective exterior view of the organ complete with enclosing casing.

FIG. 6 is a bottom plan view of the outer casing of the organ, shown detached.

FIG. 7 is a fragmentary perspective view showing detached, the housing illustrated with accompanying parts in FIG. 3.

FIG. 8 is a fragmentary perspective view showing detached, the housing illustrated with accompanying parts in FIG. 4.

FIG. 9 is a view similar to FIG. 3 but showing the invention in somewhat modified form.

FIG. 10 is a detail section taken on the line 10—10 of FIG. 9 looking in the direction of the arrows, and with the key members omitted, which appear at the upper right of FIG. 9.

Referring first more particularly to FIGS. 1 and 2, the organ is shown as having a baseboard 1 which supports the structure as a whole. A housing 2 (FIG. 2) surrounds a chamber 3 (FIG. 2) into which air may be drawn through appropriate openings 4 in baseboard 1,

by a centrifugal blower 5 powered by the motor 6 as indicated schematically in FIG. 3.

The piano type keyboard is positioned above this chamber 3 and is shown as comprising the longer keys 7 which will usually correspond to the full notes of the scale, and the shorter keys 8 corresponding to the sharps or flats. Usually this piano type keyboard will cover primarily the treble range or any desired part thereof. Preferably the mountings of the keys 7 and 8 and their correlation with the air supply are as later described in more detail.

The air delivered by the blower 5 passes upwardly through an opening 9 (FIG. 3) in the top wall 10 of chamber 3 into an air pressure chamber 11 which overlies chamber 3, and lies behind and extends above the piano type keyboard constituted by the keys 7 and 8. This air pressure chamber 11 extends the full length of the piano type keyboard.

A housing 12 overlies the pressure chamber 11 and is shown as having a series of vibratory reeds 13 alined with slots 14 in plates 14*a* at the bottom of the housing so that air passing from chamber 11 through the interior of the housing 12 will set up sound-producing vibrations in the reeds. A pad 12*a* (FIG. 4) of felt or the like may be interposed between housing 12 and the adjacent wall. Interior partitions 15 are provided in the housing 12 and are interposed between the successive reeds, thereby defining passages 17 which extend through the upwardly directed wall 16 of housing 12, which passages are respectively alined with the reeds 13.

The keys 7 and 8 are pivotally mounted upon a spindle 18 extending along the keyboard under discussion, and are respectively provided with upwardly directed finger-like extensions 7*a* and 8*a* which when idle, respectively overlie the passages 17 above referred to which are in line therewith. Springs 19, preferably of the helical type, are provided underneath the keys 7 and 8, and urge the latter into sealing positions with respect to the passages 17. A pad 16*a* (FIG. 7) of felt or the like may overlie the wall 16. When any particular key is depressed, its upward extension is moved away from the corresponding passage 17, thus affording sound producing flow of air from chamber 11 past the corresponding reed 13 and through the passage 17 in housing 12 which is defined by the adjacent partitions 15, and then out through the wall 16 into the space within the outer casing 35 hereinafter referred to.

The chord type keyboard is mounted at one end of and approximately in line with the above described piano type keyboard. Preferably the chord type keyboard comprises alined rows of keys constituted by the buttons 20 on levers 21 (FIG. 1) which are pivotally mounted on shafts 22 extending along the keyboard, these levers being provided with integral extensions 21*a* (FIG. 4) which serve purposes similar to the extensions 7*a* and 8*a* previously described. The keys 20 may be understood as similar in mode of operation to the keys 7 and 8 previously described, except that each key 20 will usually serve a group of reeds producing a selected chord, so that various chords appropriate for accompanying various melodies as produced by the operation of the piano type keyboard, may be produced by operation of the chord type keyboard.

The chord type keyboard is served by an air pressure chamber 23 (FIG. 4) on the top wall 24 of which the rows of keys 20 are mounted. The chamber 23 will be substantially smaller in volume than pressure chamber 11 previously referred to, and air under pressure for the chamber 23 flows from chamber 11 through a restricted passageway 25 (FIG. 2) through the wall 10 previously referred to which may constitute the bottom wall of chamber 11, and then through a compartment 26 (FIG. 2) which communicates with chamber 23 through a further passageway 27. The area of the restricted passage-

way connecting the two pressure chambers 11 and 23 should be substantially less than the cross-sectional area of chamber 11, for example about one fourth of the latter, to the end that when both of the keyboards are in operation, the air pressure in chamber 23 will be substantially less than in chamber 11, thereby substantially reducing the sound produced by operation of the chord type keyboard, as compared to the sound produced by operation of the piano type keyboard which will normally be producing the melody.

Housings 28 (FIGS. 4 and 8) may be understood as mounted on the opposite side walls of the pressure chamber 23 (sealing pads 23*a* of felt or the like being provided) and in communication with such chamber through the openings 29 in such side walls. Reeds 30 (FIG. 4) are provided in alinement with slots 31 through plates 31*a*, at the inner walls of the housings 28, in a general way similar to the reeds 13 and slots 14 previously described, along with interior partitions 32 similar to the partitions 15 previously described, except that each successive set for example of three reeds 30 may be of pitches as needed to produce a selected chord. The housings 28 will also be provided with passages 33 which extend therethrough, and each of the extensions 21 of the keys constituting the chord type keyboard may be understood as sealing one of the above mentioned sets of reeds 30 when the keys are held closed by the U type spring members 34 shown in FIG. 4. Thus depression of one of the keys 20 sounds a chord by affording flow of air fram chamber 23 past the corresponding set of reeds 30 served by such key.

The coordination of the two keyboards as above described, with the chord type keyboard disposed at one end of and substantially alined with the piano type keyboard, and with the air pressure chambers respectively serving the keyboards disposed as above described, readily lends itself to a compact assembly as shown which is relatively small in displacement, rendering the instrument easily portable and capable of being supported by a relatively small table or stand.

An outer enclosing casing as indicated generally at 35 (FIGS. 5 and 6) is preferably provided, having a top wall 36 which overlies the housing 12, and which may have sound emitting slots 37 therethrough. The outer casing is also shown as having a shelf 38 provided with openings 39 through which the keys 20 of the chord type keyboard are exposed, and a large opening 40 through which the keys 7 and 8 are exposed.

For purposes of electronic sound amplification and reproduction, one or more microphones 41 (FIG. 6), may be provided in the casing 35, these microphones being shown as connected to an outlet socket 42 adapted to receive a connector plug (not shown) leading to appropriate amplifying and sound reproducing equipment. To enable the microphones 41 to function satisfactorily, I have found it to be important that they be located above the housing 12, just under the top wall 36 of the outer casing. The microphones will receive sound waves from the spaces within casing 35 which are above the keys 7, 8 and 20.

FIGS. 9 and 10 refer to a form of the invention in which a given key serves two reeds which are very slightly displaced as to pitch or frequency of vibration, the two reeds being thus simultaneously activated when the key is depressed, to produce a vibrato effect. Referring first more particularly to FIG. 9, the parts 1*a*–11*a* may be understood as respectively similar in construction and mode of operation to the parts 1–11 previously described in connection with FIGS. 1 to 8. Also the housing 12*b* of FIG. 9 may be understood as constructed similar to the housing 12 in respect to its constituent parts as shown more in detail in FIG. 7, the housing 12*b* being provided with a set of reeds 13*a*, passages 17*a* etc. which are activated when the corresponding extensions 7*b* or 8*b* of the keys 7*a* and 8*a* are depressed. In this instance however a second housing 12*c*, internally similar to the housings 12 and 12*b*, is interposed in the pressure chamber 11*a* at an intermediate level between the air admission opening 9*a* and the housing 12*b*, in such manner that air entering chamber 11*a* will flow in parallel, so to speak, past the corresponding reeds of the two housings, whenever the keys serving corresponding reeds of the two sets of reeds, are depressed. The passageway 25*a* of FIG. 10 may be understood as equivalent to the passageway 25 already described. The housing 12*c* may be provided with rearwardly extending supporting arms 43 (FIG. 10) which are seated in notches provided in posts 44 extending up from the top wall 10*a* of chamber 3*a*, these arms 43 being spaced apart as shown in FIG. 10 to afford the ready flow of air past the housing 12*c* to housing 12*b*. The reeds of the two sets of reeds under discussion may be such in number and pitch as to produce the vibrato effect throughout or in desired portions of the treble and bass ranges, it being understood that the particular reeds of the two sets which are activated when particular keys are depressed, will be slightly different in pitch to produce the vibrato effect above mentioned.

While the invention has been disclosed as embodied in an organ of the above described specific form, it should be understood that changes may be made therein without departing from the invention in its broader aspects, within the scope of the appended claims.

I claim:

1. In a chord type reed organ of the character described having a series of keys arranged to constitute a piano type keyboard, said organ having a chamber disposed underneath said keyboard and containing blower means for drawing in air, reeds respectively controlled by the keys of said keyboards, means associated with said keys whereby said keys respectively control the passage of air past said reeds, and a keyboard of the chord type disposed at one end of said first mentioned keyboard and substantially aligned therewith, said last mentioned keyboard having rows of keys and sets of reeds respectively serving the same; the improvement which comprises, means defining a first air pressure chamber disposed rearwardly of said piano type keyboard and in communication with said chamber disposed underneath said keyboard, said reeds being interposed respectively between the keys of said piano type keyboard and said first air pressure chamber, said organ having a second air pressure chamber disposed underneath said second mentioned keyboard substantially at the level of said above mentioned chamber which is disposed underneath the piano type keyboard, said sets of reeds being interposed respectively between the keys of said chord type keyboard and said second mentioned pressure chamber, means associated with the keys of said rows of keys whereby the same respectively control the passage of air from said second mentioned pressure chamber through said sets of reeds, and conduit means between said chambers affording the flow of air from said first air pressure chamber disposed rearwardly of said piano type keyboard to said second pressure chamber disposed underneath said second mentioned keyboard.

2, A chord type reed organ according to claim 1, wherein said conduit means includes means defining a passageway adjacent said end of said first keyboard and means defining apertures in said passageway establishing communication between said pressure chambers to place said second pressure chamber in series with said first pressure chamber through said passageway.

3. In a chord type reed organ of the character described having a series of keys arranged to constitute a piano type keyboard, said organ having a chamber containing blower means for drawing in air, reeds respectively controlled by the keys of said keyboard, means associated with said keys whereby said keys respectively control the passage of air past said reeds, and a keyboard of the chord type disposed at one end of said first mentioned keyboard and substantially aligned therewith,

said last mentioned keyboard having rows of keys and sets of reeds respectively serving the same, means defining a first air pressure chamber in communication with said blower chamber, said reeds being interposed respectively between the keys of said piano keyboard and said first air pressure chamber, said organ having a second air pressure chamber, said respective sets of reeds being tuned to sound selected chords when vibrated, and being interposed between the respective keys of said rows of keys of said chord type keyboard and said second mentioned pressure chamber, and conduit means between

said chambers affording the flow of air from said first air pressure chamber to said second air pressure chamber.

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