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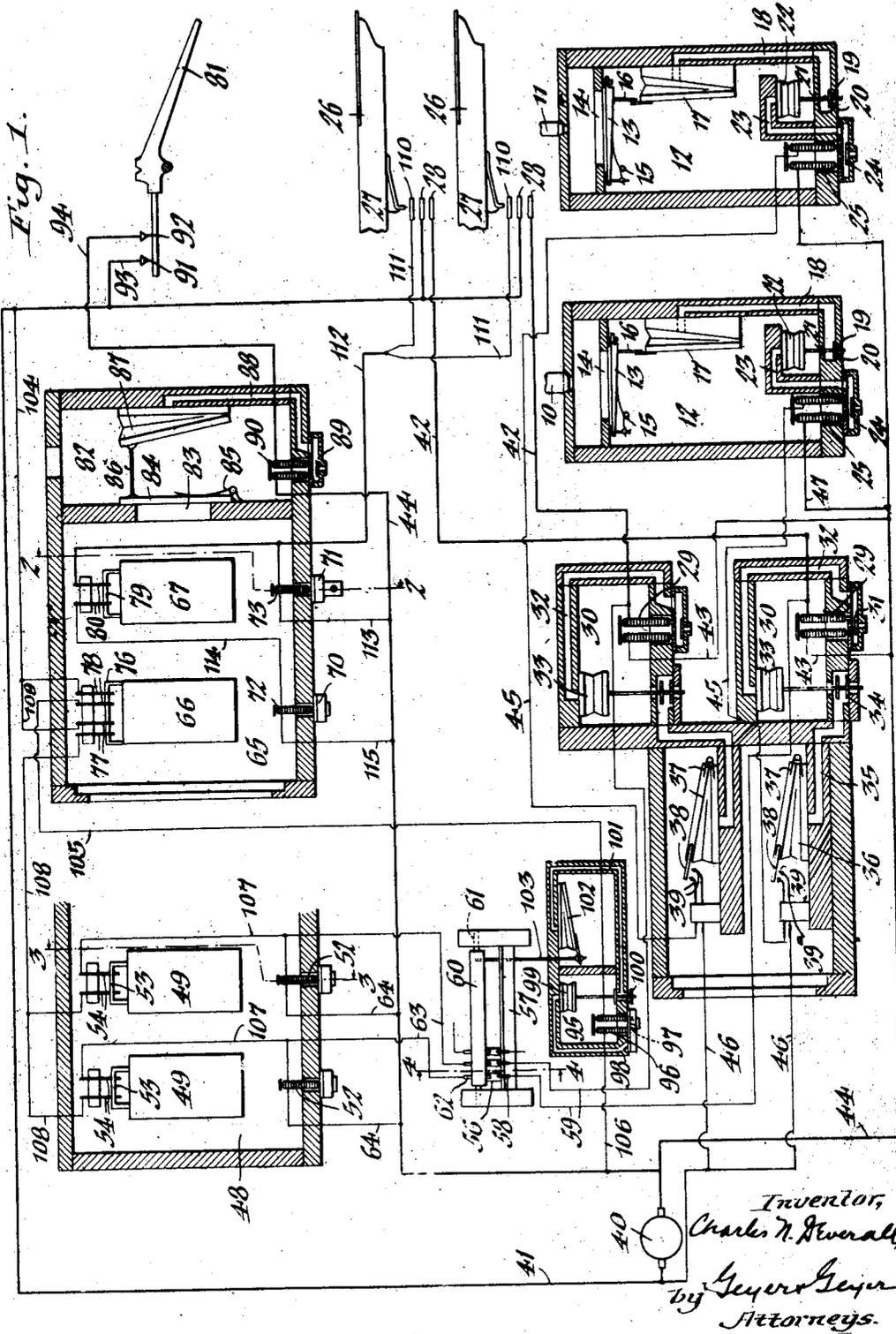
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1,769,369

SOSTENUTO DEVICE FOR ORGANS

Filed Dec. 18, 1925

2 Sheets-Sheet 1



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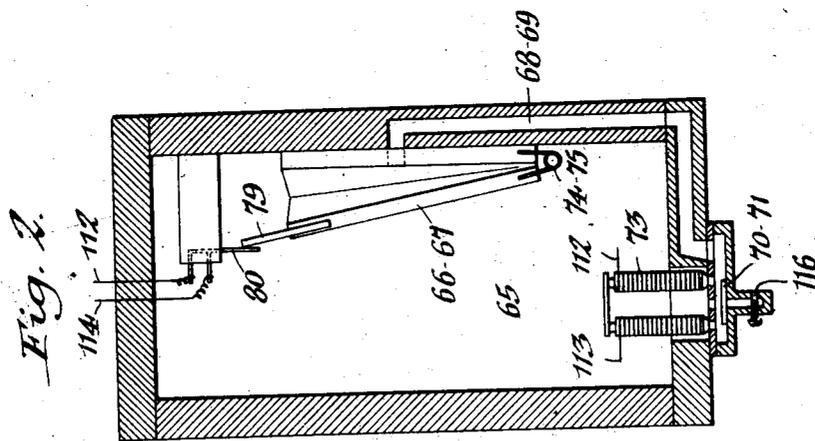
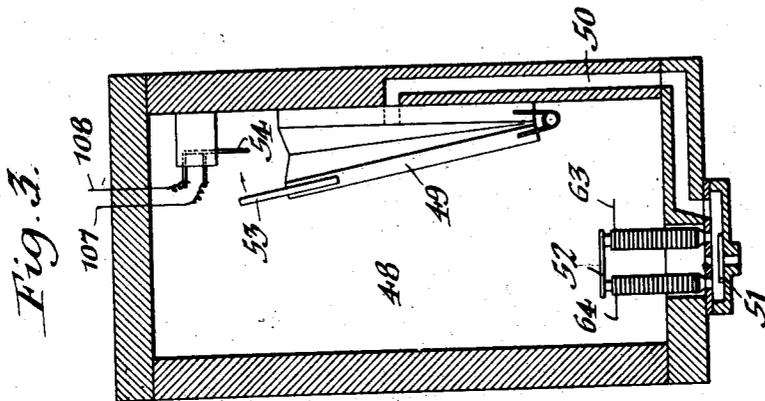
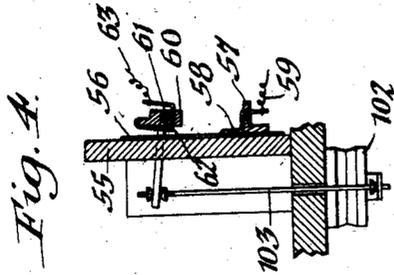
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SOSTENUTO DEVICE FOR ORGANS

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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SOSTENUTO DEVICE FOR ORGANS

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This invention relates more particularly to pipe organs of the electro-pneumatic type.

Its chief object is the provision of a reliable mechanism which enables certain notes or chords to be sustained without keeping the keys depressed, as required in ordinary organs, thus leaving the hands free to play other parts of the organ.

Another object of the invention is to provide a sostenuto or sustaining mechanism which is so organized and combined with an organ manual, that upon depressing and releasing a key, the corresponding organ pipe or other sound-producing part will continue to speak until another key is depressed and released, whereupon the playing of the first-named note will be automatically stopped.

The invention further consists in certain improvements and combination of parts hereinafter more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a diagrammatic view of an electro-pneumatic organ action with my invention embodied therein. Figures 2, 3 and 4 are transverse sections on the correspondingly numbered lines in Fig. 1.

Similar characters of reference indicate corresponding parts throughout the several views.

In its general organization, this invention comprises three distinct actions, namely, (1) the customary electro-pneumatic devices including a relay action which causes an organ pipe or pipes to speak whenever a key or keys on a given manual is depressed; (2) a sustaining or sostenuto device associated with the relay action which serves to maintain the latter in an operative position to cause a note to continue to speak after the corresponding key has been released; (3) and a breaker and release device for automatically silencing the speaking of an organ pipe or pipes whenever another key on the manual is depressed.

In the preferred embodiment of the invention shown in the drawings, I have shown a pair of organ pipes 10, 11 each of which is supplied with air from a corresponding

windchest 12 under control of the usual pallet valve 13 applied to the port 14. This pallet valve is normally held closed by a spring 15 and is opened through the medium of its arm 16 by the collapsing of a pneumatic 17 located in the wind chest and exhausted through the passage 18 and port 19. The latter is controlled by the customary valve 20 which also controls the port 21 opening into the windchest 12, said valve being actuated by a pneumatic 22 exposed to the interior of the chest and communicating therewith through a passage 23. An electro-pneumatic primary valve 24 controls this last-named passage so that when the magnet 25 thereof is energized the pneumatics 17 and 22 are collapsed and the corresponding pipe 10 or 11 is sounded.

Each playing key 26 carries a finger 27, which, when the key is depressed, bridges a pair of contacts 28 and closes a circuit that includes the electromagnet 29 of a pneumatically-controlled relay action. This relay action is of the customary type and comprises a windchest 30 containing the electromagnet 29 which controls the disk valve 31 that supplies air from said windchest through a passage 32 to a pneumatic 33 which in turn actuates a valve 34 controlling the supply of air from the windchest through a passage 35 leading to a relay motor or pneumatic 36 which is held collapsed by a spring 37. The movable board of the pneumatic 33 carries a metallic bar 38 adapted to bridge a pair of contacts 39 applied to a block 39^a. When the electromagnet 29 is energized, the pneumatic 33 is collapsed and an electric circuit including the contacts 39 is closed. This circuit, which will be referred to as the "main circuit," includes a generator 40 from which a feed wire 41 leads to one of the contacts 28; a wire 42 leading from the other of said contacts to one of the coils of the electro-magnet 29; a wire 43 connected to the other coil of the latter and leading to a return wire 44 connected to the other side of the generator. The electromagnet 25 of the pipe action is included in a branch circuit governed by the relay action and includes wires 45, 46 leading from the contacts

39 and connected, respectively, to one of the coils of the magnet 25 and to the wire 41, the other coil of said magnet being connected by a wire 47 with the wire 44. Thus, when a playing key is depressed, the corresponding main circuit, together with its branch circuit, is closed and the corresponding organ pipe is sounded.

For the purpose of causing a given note on the organ to continue to speak even after the organist has released his finger from the playing key, a sostenuto device is provided which operates electro-pneumatically and functions, when drawn through the medium of a customary stop, to maintain the contacts 39 of the corresponding relay action closed, producing the same result as if the playing key was continuously held down. To this end, the sostenuto device consists of an electropneumatic action including a motor or pneumatic, together with its magnet and electric contacts, one for each of the motors 36 of the relay action to be operated, and a sostenuto switch for throwing this sostenuto action on and off at the will of the organist. Also connected with the sostenuto action and its switch is a breaker and release device which functions to automatically silence a speaking organ pipe when another key is depressed and at the same time cause such other pipe to continue speaking until still another key is depressed and so on. This sostenuto device comprises a wind chest or pressure chamber 48 which is in constant communication with the wind supply of the instrument and which contains as many motors or pneumatics 49 as there are motors 36 of the relay action. Each of said pneumatics 49 is in communication with the wind chest through a passage 50 controlled by an electro-pneumatic valve 51, so that when the magnet 52 thereof is energized the corresponding pneumatic is collapsed. The latter carries a contact yoke 53, which, in the collapsed condition of the pneumatic, bridges a pair of contacts 54 and closes a circuit including the sostenuto switch and the breaker and release device.

The sostenuto switch, which is included in a circuit connecting the relay action with the sostenuto pneumatics, preferably consists of a panel 55 provided on its face with a plurality of bronze contact strips or bars 56 arranged in parallel and suitably insulated from one another. Extending transversely of this panel is a spreader rail 57 having a plurality of terminals 58 corresponding in number to and in permanent contact with the bronze contact strips. Each terminal 58 is connected by a wire 59 with the wire 42 leading to the corresponding relay motor magnet 29. Movable into and out of engagement with the contact strips 56 is a rocking switch-head 60 which is supported at its ends on fulcrum pins 61 and which car-

ries a plurality of contacts 62, preferably of wire, adapted to engage the companion contact strips. Each of the switch-head contacts is connected by a wire 63 with one of the coils of the magnet 52 of the corresponding sostenuto pneumatic 49, the other coil of said magnet being connected by a wire 64 with the wire 44 leading to one of the terminals of the generator 40. Thus, whenever this sostenuto switch is moved to its closed or open position, the sostenuto pneumatics 49 are rendered operative or inoperative, respectively, to sustain or release a pipe on the organ when a playing key is depressed and then released.

The so-called breaker and release device is in effect a controlling device and functions to momentarily act on the sostenuto device and automatically silence a given note, which has been speaking through its pipe or other sound-producing part, whenever another manual key is depressed, and at the same time operates in such a manner as to cause the note sounded by such key to be sustained until another key is depressed. To this end, a windchest 65 is provided containing a release pneumatic 66 and a breaker pneumatic 67 which communicate with said windchest through passages 68, 69, respectively, controlled by corresponding electro-pneumatic valves 70, 71 so that when the magnets 72, 73 thereof are energized the pneumatics are collapsed, the latter being normally held inflated by springs 74, 75. The release pneumatic carries a contact yoke 76, which, in the normal inflated condition of said pneumatic, is adapted to bridge sets of contacts 77, 78, while the breaker pneumatic carries a similar yoke 79 adapted to bridge a pair of contacts 80.

The admission of wind or pressure to the wind chest 65, which normally serves to maintain the pneumatics 66, 67 inflated and their several contacts bridged or closed, is controlled by a ventil or valve opened and closed electropneumatically through the action of the "sostenuto" stop key 81, which acts as a switch. The windchest 65 receives its wind from an adjoining pressure chamber 82 through a port 83 controlled by a pallet valve 84 normally held closed by a spring 85. This valve is opened through a connecting link 86 by the collapse of a pneumatic 87 arranged in the pressure chamber and exhausted through a passage 88 controlled by the electropneumatic valve 89 of a magnet 90. When the stop key 81 is drawn or moved to operative position, it bridges a pair of contacts 91, 92, one being connected by a wire 93 with the feed wire 41 from the generator 40 while the other is connected by a wire 94 leading to one of the coils of the magnet 90, the other coil thereof being joined to the return wire 44 of the generator. This results in the energizing of

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said magnet and the collapse of the pneumatic 87 to open the pallet valve 84 thereby supplying wind to the chest 65. Under these conditions, the pneumatics 66, 67 are inflated and the sets of contacts 77, 78, and 80 are bridged and the circuits including them are closed at these points.

In addition to operating the vent, the stop key 81 is included in an auxiliary circuit for controlling the opening and closing of the sostenuto switch, which, as heretofore stated, controls the sostenuto action including the motors 49. Said sostenuto switch is actuated by an electro-pneumatic device including a wind chest 95 containing an electro-magnet 96 which operates a disk-valve 97 that supplies air from the chest through a passage 98 to a pneumatic 99, which in turn actuates a valve 100 controlling the supply of air from the wind chest through a passage 101 leading to a pneumatic 102 connected by a link 103 with the movable switch-head 60. The energizing of said electro-magnet results in the inflation of the pneumatic 102 which acts to rock the movable head of the sostenuto switch to its "on" position. This auxiliary circuit established by the drawing of the stop key, includes the stop key contact 91, wire 93, a wire 104 joined at one end to the generator feed wire 41 and at its other end to one of the contacts 78 of the release pneumatic 66, a wire 105 connected to the other of said contacts 78 and to one of the coils of the magnet 96, a wire 106 leading from the other magnet-coil and connected to the return wire 44 of the generator, and thence from said return wire to the magnet 90 and wire 94 to the companion stop key contact 92. Thus, when the stop key 81 is drawn, it first opens the vent and admits wind to the chest 65 of the sostenuto action, inflating the breaker and release pneumatics 66, 67, which latter in turn close the contacts 77, 78 and 80; and second, it closes the sostenuto switch, thereby placing the instrument in readiness to sustain certain notes when their corresponding keys are depressed, without the organist having to hold them down for this purpose.

Each playing key 26, in addition to performing its usual function of sounding the organ pipe by closing the circuits through the corresponding magnets 29 of the relay action, simultaneously acts, when the "sostenuto" stop key is drawn, to establish a circuit for actuating the corresponding pneumatic 49 of the sostenuto action, which in turn establishes an auxiliary supply circuit for causing the organ pipe to continue to speak even after the playing key is released by the organist. When the stop key is "on" and a playing key is depressed, the corresponding magnet 52 of the sostenuto action is energized, resulting in the collapse

of its pneumatic 49 and the closing of the contacts 54. One of these contacts is directly connected by a branch wire 107 with the wire 63 leading from the sostenuto switch to said magnet, while the other contact is connected by a wire 108 with one of the contacts 77 associated with the release pneumatic 66, the companion contact 77 being joined by a branch wire 109 to the wire 104 leading to the generator feed wire 41 and thence to one of the playing key contacts 28 and to the stop key contact 91. Thus, the auxiliary circuit is established for keeping the magnet 52 energized and the corresponding pneumatic 49 of the sostenuto action collapsed with its contacts 54 closed. Following this circuit from the generator 40, it includes wires 41, 104 and 109, contacts 77, wire 108, contacts 54, wire 107, magnet 52, wire 64 and return wire 44 to the generator. It will also be noted that as long as the contacts 77 of the release pneumatic 66 are closed by its inflated condition and the contacts 54 are bridged by the collapsed condition of their pneumatic 49, a part of this auxiliary supply current flows through wire 63, sostenuto switch members 60 and 56, wire 59, magnet 29 of the relay action and through wire 43 to the generator, thereby maintaining the corresponding relay motor 36 collapsed and causing the continued speaking of the organ pipe even after the release of the depressed manual key, leaving the hand of the organist free to temporarily manipulate other parts of the organ. However, the moment the breaker and release pneumatics 66, 67 are collapsed, their contacts 77, 78 and 80 are not only broken, but also the contacts 54 of the sostenuto pneumatic 49 corresponding to the pipe which has been speaking. This breaking of the contacts, which is only for a brief period, causes the pipe to stop speaking and is effected by the depression of another manual key, the note of which is to be sustained, by the following means:—

Each key 26, in addition to performing the functions heretofore described, controls the collapsing of the breaker and release pneumatics 66, 67 to temporarily break the circuits including their respective contacts 77, 78 and 80, said pneumatics being so coupled as to cause the breaker pneumatic to momentarily actuate the release pneumatic. To this end, the key-finger 27 is adapted to engage not only the contacts 28 but also a contact 110 connected to one of the wires 111 of a "trap cable", common to all keys, whose free end is joined to a single wire 112 leading to a coil of the magnet 73 of the breaker pneumatic and also to one of the contacts 80. The other coil of said magnet is connected by a wire 113 with the return wire 44 of the generator, while the magnet 72 of the release pneumatic is connected by

a wire 114 to the other contact 80 and by a wire 115 with said return wire. The magnet 73 is energized when a manual key is depressed to close the circuit including it, the current being supplied through the feed wire 41, contacts 28 and 110, wires 111 and 112 to the magnet 73 and wire 113 to the return wire 44, thus collapsing the breaker pneumatic 67 and breaking the circuit at the contacts 80. Before the contact at 80 is broken, however, a momentary current is supplied to the magnet 72, collapsing the release pneumatic 66 and breaking the circuit at the contacts 77, 78, so that the circuit including the corresponding contacts 54 of the sostenuto pneumatic 49 and the contacts 39 of the companion relay pneumatic 36 are broken and the organ pipe which was speaking is automatically stopped. In order that the note of the second key will be sounded and sustained while the speaking of the first note is simultaneously stopped, the magnet of the breaker pneumatic has a bleed 116 communicating with its exhaust passage 69 and opening into the atmosphere, which construction allows said pneumatic to operate or collapse only momentarily and then be inflated again. This action results in the contacts 80 being broken for only a fraction of a second, thereby returning the release motor to its original inflated position. During the short period that said contacts 80 are broken, however, the sustained note is stopped and as soon as such contacts are closed again, which is practically instantaneous, the contacts 54 of the sostenuto pneumatic corresponding to the new note will be closed and its pipe will continue to speak or be sustained until another key is depressed.

Briefly stated, the operation of the mechanism is as follows:

When the organist desires to sustain certain notes or chords and still leave his fingers free to operate other parts of the organ, he draws the sostenuto stop key 81. This opens the vent or valve 84 and admits wind to the sostenuto action chest 65, the pneumatics 49, 66 and 67 being held in their inflated positions by the springs at their hinged ends, and the contacts 54 being open and the contacts 77, 78 and 80, respectively, being closed. The drawing of the stop key also closes the circuit which effects the actuation of the sostenuto switch 56 and 60 to its "on" position. Now the organist depresses a key which is to be sustained. An electric circuit is thereby established which operates the corresponding pneumatic 36 of the relay action, sounding the organ pipe in the usual manner. From the operating magnet 29 of this pneumatic, the current flows through the sostenuto switch 56, 60, which was just previously moved to "on" position by the stop key, to the magnet 52 of the corresponding sostenuto motor 49, collapsing the latter and closing its contacts 54. It will be noted that these contacts and therefore the companion magnet 52 connected therewith are already being supplied with current through the closed contacts 77 of the release pneumatic 66, so that the circuit, established by the playing key and including the relay magnet, sostenuto switch and contacts 54, will be maintained as long as said release pneumatic is not deflated through the action of its magnet 72, and as this magnet is directly controlled by the breaker pneumatic 67, whose magnet is in turn energized by the manual key, the current supply through said contacts 77 will be continuous until another key is depressed. As soon as another key is depressed, the magnet of the breaker pneumatic will operate in the manner heretofore described, temporarily cutting off the sostenuto action to silence the particular pipe or pipes which were speaking and sustaining the new note or notes represented by the last key depressed.

I claim as my invention:

1. In an organ, the combination with the sound-producing elements and the manual for controlling them, of means controlled by the keys of said manual for sustaining the sound-producing elements after the corresponding manual keys have been depressed and released by the organist.
2. In an organ, the combination with the sound-producing elements and the manual for controlling them, of a sostenuto action for the sound-producing elements controlled by the keys of the manual, and a controlling element for rendering said sostenuto action operative or inoperative.
3. In an organ, the combination with the sound-producing elements and the manual for controlling them, of means controlled by the keys of said manual for sustaining the sound-producing elements after the corresponding manual keys have been depressed and released by the organist, and means for silencing the speaking of said selected sound-producing elements whenever another key on the manual is depressed.
4. In an organ, the combination with the sound-producing elements and the manual for controlling them, of a sostenuto action for the sound-producing elements controlled by the keys of the manual, a controlling element for rendering said sostenuto action operative or inoperative, and automatic means for silencing the speaking of a selected sound-producing element whenever another key on the manual is depressed.
5. In an organ, the combination with the sound-producing elements and the manual for controlling them, of sostenuto devices for the sound-producing elements, means for applying the sostenuto devices whenever a manual key is depressed to sustain its sound-

producing element, and means for releasing the corresponding sostenuto device of a previously depressed key to silence its sound-producing element whenever another manual key is depressed.

6. In an organ, the combination with the sound-producing elements and the manual for controlling them, of sostenuto devices for the sound-producing elements, means controlled by the manual keys for applying said sostenuto devices, and means also under the control of the manual keys for releasing the applied sostenuto device associated with a given key when another key is depressed.

7. In an electro-pneumatic organ, the combination with a manual, sound producing elements and means for actuating the latter, of sostenuto means controlled by the manual keys for sustaining the effect of the actuating means of said sound-producing elements after a key or keys have been depressed, and means for discontinuing the action of the sostenuto means on such sustained elements the moment another element is sounded by the depression of its corresponding key.

8. In an electro-pneumatic organ, the combination with sound-producing elements and means for actuating the same including a manual, of sostenuto means controlled by the manual keys for sustaining the effect of the actuating means of the sound producing elements when a key or keys are depressed, and automatic means also controlled by the manual keys for simultaneously stopping the speaking of the sustained sound-producing elements when a second key or keys are depressed and rendering the sostenuto means of the second depressed key or keys active for sustaining the corresponding sound-producing elements.

9. In an electro-pneumatic organ, the combination with sound-producing elements and means for actuating the same including a manual, of sostenuto means controlled by the manual keys for sustaining the effect of the actuating means of the sound producing elements when a key or keys are depressed, a controlling element for rendering the sostenuto means operative or inoperative, and automatic means, operative when said controlling element is in its operative position, for discontinuing the action of the sostenuto means on such sustained sound-producing elements the moment another element is sounded by the depression of its corresponding manual key.

10. In an electro-pneumatic organ, the combination with sound-producing elements and means for actuating the same including a manual, of electro-pneumatically operated sostenuto devices controlled by the manual keys for sustaining the effect of the actuating means of the sound-producing elements when a key or keys are depressed, and elec-

tro-pneumatic means adapted to render the sostenuto devices operative when the circuit including them is closed, said means being governed by the manual keys, whereby the circuit is momentarily broken when a second key is depressed to discontinue the action of the sostenuto devices on the sustained sound-producing elements.

11. In a pneumatic organ, the combination with sound-producing elements, electro-pneumatic actuating means therefor and manual keys for closing the circuit through the latter, of electro-pneumatic sostenuto devices included in the key-circuit for sustaining the sound-producing elements upon depressing the corresponding manual keys, a supply circuit auxiliary to the key-circuit for maintaining the sostenuto devices operative to sustain the sound-producing elements upon the release of their manual keys, and a circuit-breaking device included in said auxiliary circuit and controlled by any one of the manual keys for momentarily breaking said circuit, whereby the sustained sound-producing elements are silenced as another element is sounded by the depression of its corresponding key.

12. In a pneumatic organ, the combination with sound-producing elements, electro-pneumatic actuating means therefor and manual keys for closing the circuit through the latter, of electro-pneumatic sostenuto devices included in the key-circuit for sustaining the sound-producing elements upon depressing the corresponding manual keys, a supply circuit auxiliary to the key-circuit for maintaining the sostenuto devices operative to sustain the sound-producing elements upon the release of their manual keys, a pair of switch contacts included in said auxiliary circuit, means for normally maintaining said contacts closed, and an electro-pneumatically operated device controlled by any one of the manual keys for momentarily actuating said contact-maintaining means to open the auxiliary circuit, whereby the sustained sound-producing elements are silenced as another element is sounded by the depression of its corresponding key.

13. In a pneumatic organ, the combination with sound-producing elements, electro-pneumatic actuating means therefor and manual keys for closing the circuit through the latter, of electro-pneumatic sostenuto devices included in the key-circuit for sustaining the sound-producing elements upon depressing the corresponding manual keys, a switch interposed in the key-circuit between the actuating means of the sound-producing elements and the sostenuto devices, electro-pneumatic means for operating said switch, a stop key controlled electric circuit including said switch-operating means, a supply circuit auxiliary to the key-circuit for main-

taining the sostenuto devices operative to sustain the sound-producing elements upon the release of their manual keys, a switch for normally closing said auxiliary circuit, and electro-pneumatically operated means controlled by the manual keys for momentarily opening said auxiliary circuit switch, whereby the sustained sound-producing elements are silenced as another element is sounded by the depression of its corresponding key.

14. In a pneumatic organ, the combination with sound-producing elements, electro-pneumatic actuating means therefor and manual keys for closing the circuit through the latter, of electro-pneumatic sostenuto devices included in the key-circuit for sustaining the sound-producing elements upon depressing the corresponding manual keys, a supply circuit auxiliary to the key-circuit for maintaining the sostenuto devices operative to sustain the sound-producing elements upon the release of their manual keys, a pair of switch contacts included in said auxiliary circuit, a pneumatic carrying a contact bar normally engaging said contacts to close the circuit including them, and a second pneumatic controlled electro-magnetically by any of the manual keys and governing the movements of said first-named pneumatic to momentarily open said auxiliary circuit whenever a manual key is depressed.

15. In a pneumatic organ, the combination with sound-producing elements, electro-pneumatic actuating means therefor, and manual keys for closing the circuit through the latter, of electro-pneumatic sostenuto devices included in the key-circuit for sustaining the sound-producing elements upon depressing the corresponding manual keys, a supply circuit auxiliary to the key-circuit for maintaining the sostenuto devices operative to sustain the sound-producing elements upon the release of their manual keys, a pair of switch contacts included in said auxiliary circuit, a wind chest, a pair of pneumatics contained therein and each having an electro-magnet for controlling it, one of said pneumatics carrying a contact bar normally engaging said contacts in the auxiliary circuit and the other pneumatic being constructed, when its magnet is energized, to momentarily actuate said first-named pneumatic and disengage its contact bar from said contacts, and an electric circuit including the manual keys and the magnet of the second-named pneumatic, whereby the sustained sound-producing elements are silenced as another element is sounded by the depression of its corresponding manual key.

16. In an organ, the combination with sound-producing elements, electro-pneumatic actuating means therefor and manual keys for closing the circuit through the latter, of a sostenuto action chest including

pneumatics and electro-magnets for controlling them, said magnets being included in the key-circuit, a switch associated with each sostenuto pneumatic, a supply circuit auxiliary to the key-circuit for maintaining the magnets of said pneumatics energized and rendering the latter operative to sustain the sound-producing elements upon the release of their manual keys, and a circuit-breaking device included in said auxiliary circuit and controlled by any one of the manual keys for momentarily breaking said circuit, whereby the sustained sound-producing elements are silenced as another element is sounded by the depression of its corresponding key.

17. In an organ, the combination with sound-producing elements, electro-pneumatic actuating means therefor and manual keys for closing the circuit through the latter, of a wind chest, sostenuto pneumatics contained in said wind chest and each having an electro-magnet for controlling them and a switch opened and closed by the inflation and deflation thereof, release and breaker pneumatics also contained in said wind chest and each having an electro-magnet for controlling them, the release pneumatics having a pair of switches and the breaker pneumatic having a switch, said switches being normally closed by the inflated condition of their pneumatics and said breaker pneumatic having a bleed for permitting only a momentary collapse thereof when its magnet is energized, a main key-circuit including the actuating means of the sound-producing elements and the magnets of the sostenuto pneumatics, an auxiliary key-circuit including said last-named magnets, the sostenuto pneumatic switches and one of the switches of the release pneumatic, said main key-circuit containing a branch circuit including the magnet and switch of the breaker pneumatic and the switch of the latter being connected to the magnet of the release pneumatic, a sostenuto switch interposed in the main key-circuit between said actuating means of the sound-producing elements and the magnets of the sostenuto pneumatics, electro-pneumatically-operated means for actuating said sostenuto switch, a stop key, an electric circuit controlled by the stop key and including the second switch of the release pneumatic and said sostenuto switch actuating means, and an electro-pneumatically operated vent for admitting wind to said wind-chest and included in a branch of the stop-key circuit.

18. In a pneumatic organ, the combination of sound-producing elements, electro-pneumatic actuating means therefor, manual keys for closing the circuit through the latter, electro-pneumatic sostenuto devices included in the key-circuit for sustaining the effect of the actuating means of the sound-

producing elements upon depressing the corresponding manual keys, and a stop key controlled switch for rendering the sostenuto devices operative or inoperative.

5 19. In a pneumatic organ, the combination of sound-producing elements, electro-pneumatic actuating means therefor, manual keys for closing the circuit through the latter, electro-pneumatic sostenuto devices
10 included in the key-circuit for sustaining the effect of the actuating means of the sound-producing elements upon depressing the corresponding manual keys, a switch for
15 controlling the sostenuto devices, and automatic means controlled by said manual keys for discontinuing the action of the sostenuto devices on such sustained sound-producing elements the moment another element is
20 sounded by the depression of its corresponding key.

20 20. In a pneumatic organ, the combination of sound-producing elements, electro-pneumatic actuating means therefor, manual keys for closing the circuit through the latter,
25 electro-pneumatic sostenuto devices included in the key-circuit for sustaining the effect of the actuating means of the sound-producing elements upon depressing the corresponding manual keys, a switch for controlling the sostenuto devices, and electro-
30 pneumatic breaker and release devices operatively connected to said sostenuto devices and controlled by said manual keys for automatically silencing a sustained
35 sound-producing element whenever another key on the manual is depressed

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