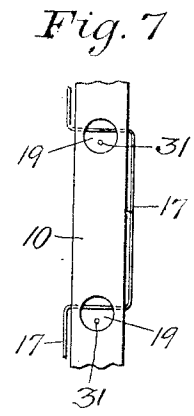
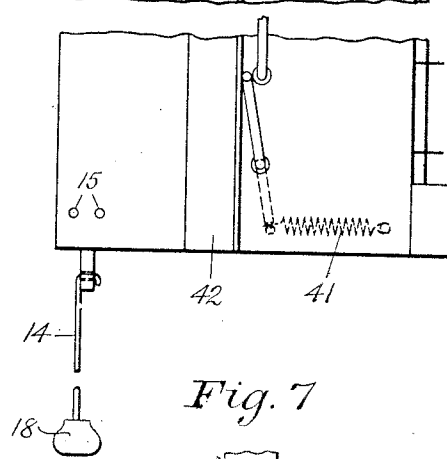
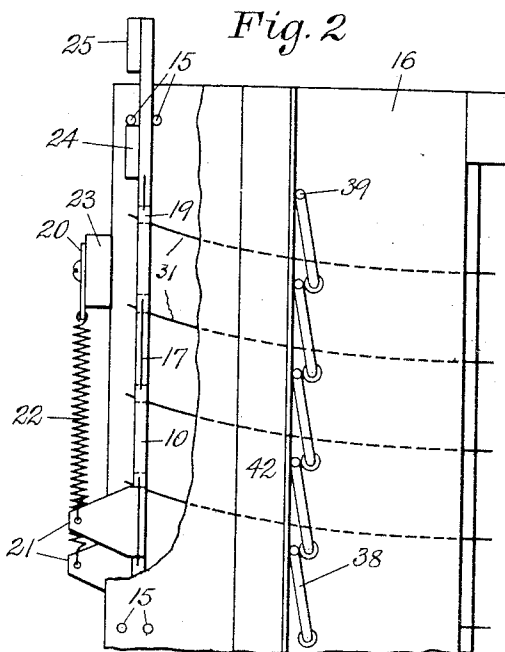
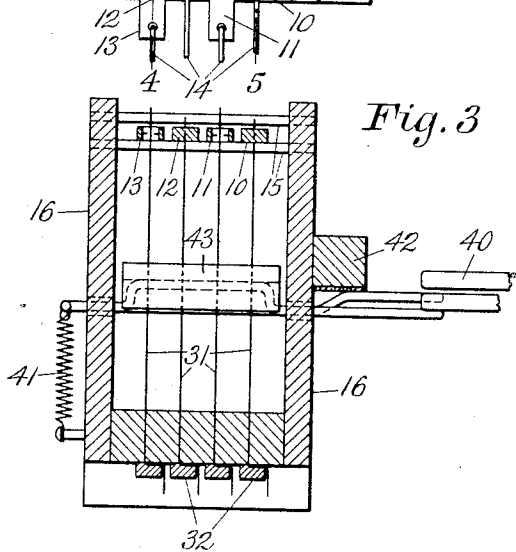
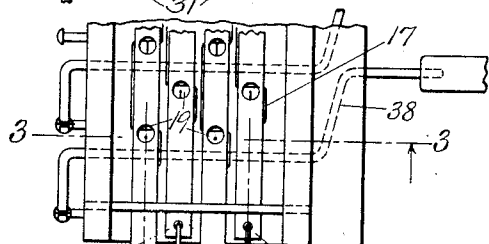
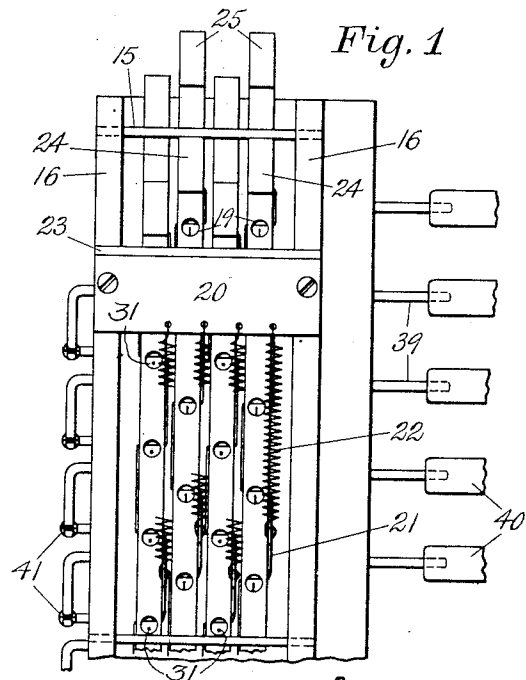


1,107,127.

Patented Aug. 11, 1914.

2 SHEETS-SHEET 1.



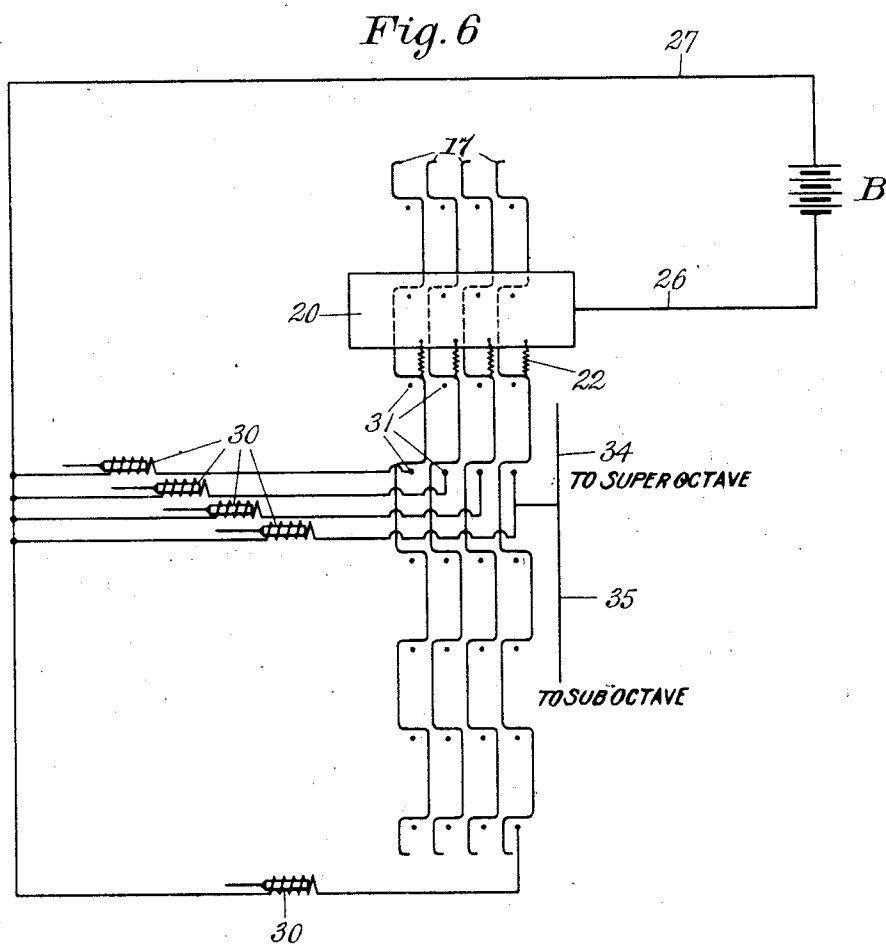
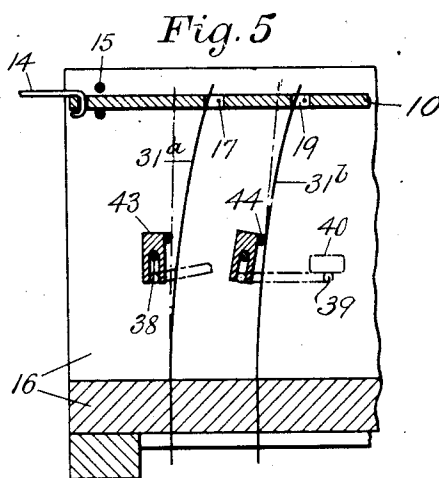
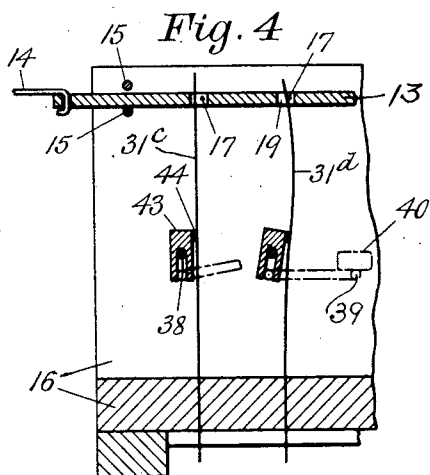
Witnesses:
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By W. H. Thomas Atty.

1,107,127.

Patented Aug. 11, 1914.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN T. AUSTIN, OF HARTFORD, CONNECTICUT, ASSIGNOR TO AUSTIN ORGAN COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF MAINE.

ELECTRIC ACTION FOR ORGANS.

1,107,127.

Specification of Letters Patent.

Patented Aug. 11, 1914.

Application filed December 30, 1907. Serial No. 408,501.

To all whom it may concern:

Be it known that I, JOHN T. AUSTIN, a citizen of the United States, and resident of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Electric Actions for Organs, of which the following is a full, clear, and exact specification.

This invention relates to improved means for arranging and operating electric actions for organs.

Figure 1 of the drawings is a plan view, and Fig. 2 is a side view of mechanism embodying the present invention. Fig. 3 is an end view in section taken on the line 3—3 of Fig. 1. Figs. 4 and 5 are fragmentary side views, showing two of the contact members in different conditions of use, these views being shown in section taken on the lines 4 and 5 respectively of Fig. 1. Fig. 6 is a diagrammatic view, illustrating a method of wiring the apparatus shown in the previous figures. Fig. 7 is a plan view in enlarged scale of a portion of one of the sliders, showing its detail construction more fully.

The embodiment of the invention which is shown in the drawings contains provision for controlling and operating four different stops of an organ, represented by the four sliders 10, 11, 12 and 13. It will, however, be understood that any additional number of similar sliders may be used for controlling additional stops or couplers, all of which is determined by the size of the organ, and especially by the number of stops to be controlled. Each of the sliders referred to includes, or may include all of the notes of an organ stop, or of any musical series of notes. The sliders are provided with any suitable connections 14, leading to suitable draw stop knobs 18 or other well-known devices situated in a convenient relation to the keyboard of the organ, within the reach of the organist to enable him to draw on the sliders selectively. The sliders rest side-by-side, and are guided for longitudinal sliding movement, preferably by means of rods 15, supported by the casing 16 on which the action is here shown to be mounted. These sliders carry a series contact wire 17, which preferably extends continuously from one end to the other of the slider and forms a contacting conductor common to all the note-controlling devices of the musical series of notes represented by the slider. Hence these

wires 17 will, for conciseness of expression, be herein designated as "series contacts." The apertures 19 corresponding with the different individual notes of the series are spaced at suitable intervals along the slider, one aperture for each of the notes of the series. The series contact 17 is carried across each of these apertures, preferably traversing the slider from side to side at each aperture 19 as represented in Fig. 7. The branch circuits represented by these common or series contacts 17 are united in a single circuit by means of the plate 20 to which each of the series contacts 17 is electrically connected by means of a clip 21 and wire spring 22. The plate 20 is supported by a bridge piece 23 appurtenant to the casing 16. The springs 22 serve to yieldingly hold their respective sliders in their upper or inoperative positions as shown in Figs. 2 and 5, each slider being provided with stop blocks 24 and 25, or equivalent means, stopping against one of the rods 15 and serving to limit the stroke of the sliders. A battery wire 26 connects the plate 20 with the battery B, from the opposite side of which a suitable wire 27 extends by suitable branches to the different note-sounding devices herein represented by the solenoids 30. These may be the primary magnetic or electro-pneumatic actions of the valve operating mechanism for the pipes or other elements of the organ. Many forms of these actions are well known, hence they need not be more particularly described.

Each of the individual note-sounding devices represented by the solenoids 30 is provided with a movable individual contact 31, which is situated in coactive relation to the common or series contact 17 of the slider, usually corresponding to the stop in which the said note sounding device belongs. These individual contacts preferably consist of flexible wires 31, each of which is set in and extends through the bottom of the casing 16, as is best shown in Fig. 3, the lower ends being held in place by the strips 32, and being wired in any convenient way to the solenoids or other note sounding devices. They may also be coupled or otherwise electrically connected as shown in Fig. 6, in which the wire 34 extends to a contact 31, representing a super-octave note, and the wire 35 extends to another contact 31 corresponding to the sub-octave note of the particular contact from which they lead. In

this way any desired notes of any desired stops may be coupled in any desired combination. Any or all of the circuits may thus be modified or extended so as to sound in conjunction with a particular note, the sub or super octave of that note, either in the same stop, or in any stop.

The upper ends of the individual contacts extend upwardly through the apertures 19 of the sliders 10, 11, 12 and 13, which thus serve to confine the otherwise free upper ends of these individual contacts, holding each one in operative proximity to its coacting contact portion of the common or series contacts 17, as best shown in Fig. 7. The parts are so arranged that the sliders when resting in their "off" position represented by the sliders 10 and 12, carry the individual contact wires to the position represented by the wires 31^a and 31^b of Fig. 5, in which position they cannot be operated by the circuit closing devices, to be hereafter described. But when the stop sliders are drawn, as shown by the position of the sliders 11 and 13 in Fig. 1, the individual contact wires 31 remain out of contact with the series or common contact 17, as shown by the contact 31^c, until the corresponding manual key or pedal key is operated, when it is moved to the position occupied by the contact 31^a, contacting with the series contact 17.

The individual contacts 31 are selectively moved into contact with their respective common contacts 17, so as to effect the sounding of the respective notes, by means of circuit closing devices, which in the present case consist of or include a set or series of cranked levers 38, technically known as "rollers". These are herein shown to be mounted for turning movement in the casing 16, being provided at one end with off-set or cranked portions 39 which are engaged by the respective keys 40 of the manual or pedal or other action of the instrument. The opposite ends, or any convenient portions of the rollers 38 are bent or cranked to receive the springs 41, by means of which the rollers are held in their off position, represented by the left hand rollers of Figs. 4 and 5, a suitable stop 42 being provided, preferably covered with felt, against which the crank ends 39 of the rollers are held by their respective springs. The portions of the rollers 38 which are adjacent to the individual contacts 31 are offset (Figs. 3, 4 and 5) and are provided with a suitable form of insulating cover to insulate them from the contacts 31. I prefer, particularly where the rollers are long, to employ a yoke or casing 43, preferably of wood, which, as shown in Fig. 3, embraces the offset portion of the roller and serves to stiffen it to a considerable extent, besides forming an insulating cover, which may be still further pro-

tected and made noiseless by the use of felt strips 44.

The coacting pairs of contact points representing the corresponding note in the different series are preferably arranged in rows running transversely of the sliders, as indicated by the transverse relation of the dots representing the individual note contacts 31 in the diagram of Fig. 6. In this way each key 40 operates through its roller 38 to control the operation of the corresponding note in each of the stops which are drawn on, without affecting those stops which are left in their "off" positions.

The operation of this device is as follows: As illustrated by Figs. 1, 4 and 5, the stop sliders 11, being drawn, will occupy the position shown in Fig. 4, and the stops 10 and 12, being left "off," the parts will occupy the position shown in Fig. 5. While the keys 40 remain unpressed the contacts 31 remain in the position occupied by the contacts 31^c in Fig. 4, being clear from its coacting series contact 17. But when a key 40 is depressed, the rocking movement of the roller bends the flexible contact, as represented by the contact 31^a into contact with its series contact 17, thus energizing the corresponding solenoid 30 and causing the sounding of that particular note in the two series or stops represented by the drawn sliders 11 and 13; while the corresponding notes in the series or stops represented by the undrawn or "off" sliders 10 and 12 will not be sounded on account of the fact that the corresponding individual contacts 31 are carried beyond the range of the contact-making movement of the rollers 38, as shown by the contact 31^b of Fig. 5 and its associated roller. Inasmuch as the upper ends of the flexible contacts 31 are confined, although loosely, in the apertures 19 of the respective sliders, they are kept apart from each other and are maintained in coacting relation to their respective series contacts 17, even though the sliders should be moved laterally to a considerable extent. Hence these sliders may be very loosely mounted so as to slide with perfect freedom, thereby also avoiding the necessity of accurate or expensive workmanship in constructing and adjusting the various parts. The apertures 19 are herein shown to be circular, merely because this is a convenient form to make. These apertures may, however, be of any desired form or contour. They may, if desired, be extended longitudinally of the sliders, so as to avoid moving the upper ends of the contacts 31 when the sliders are in the off position shown in Fig. 5, thereby leaving those contacts 31 resting against the rollers 43, as shown by the dot-and-dash line in Fig. 5, in which the series contact 17 would still be out of contacting relation. This, however, would necessitate bending

every contact 31 of a transverse series whenever the key for that note is operated, and this in the case of a large number of notes might impose undue or uneven resistance to the key action. Hence, for most purposes, I prefer to move the contacts 31 away from the circuit closing rollers 43, as shown in Fig. 5, when the stop sliders are moved to their off position.

For convenience as well as definiteness in the description and claims, the term "series contacts" is herein employed as referring to the conductors 17, which, in the specific form herein shown and described, are common to the series of notes or note sounding devices controlled by the respective sliders 10, 11, 12 and 13. Thus the term "series" is used, not in its strictly technical sense in the electrical arts, but in its more ordinary significance as relating to a row or set or series of notes or note-sounding devices which are connected or associated in a musical or mechanical sense. The term "transverse series" as herein employed refers to a row or series of the individual contacts 31 arranged transversely of the general direction of the wires 17, including, as exemplified in the drawings, any transverse row of contacts 31 operated by a single circuit closer 38.

I claim as my invention:—

1. The combination, in electric actions for organs, of an electric circuit having a pair of contacts one of which is flexible, a note-sounding device arranged in the circuit, key operated means for bending the flexible contact against the other contact, and means for moving one of the said contacts out of contacting relation to its associated contact.

2. The combination, in electric actions for organs, of an electric circuit provided with a pair of contacts, one of which is flexible, a note-sounding device arranged in the circuit, key-operated means for bending the flexible contact against the other contact, and means for moving the said other contact out of the range of the normal contact closing movement of the flexible contact.

3. The combination, in electric actions for organs, of a plurality of note sounding devices arranged in branch electric circuits, a pair of contacts in each branch for the respective note sounding devices, including a flexible contact, means for selectively closing a branch circuit through its pair of contacts by bending the said flexible contact, and means for moving one of the members of each pair of contacts out of contacting relation to its associated contact.

4. The combination, in electric actions for organs, of a plurality of note sounding devices arranged in branch electric circuits, a pair of contacts in each branch for the respective note sounding devices, each branch being provided with a pair of contacts, including a flexible contact, means for se-

lectively closing a branch circuit by bending the flexible contact of that branch, and means for moving the other contact of that branch out of contacting relation to its associated flexible contact.

5. The combination, in electric actions for organs, of a plurality of series of note-sounding devices arranged in branch electric circuits, a flexible contact in the branch circuit of each of the note sounding devices, a series conductor having contacting surfaces disposed in proximity to said flexible contacts for that series, key operated means for selectively bending the flexible contacts of the respective branches against their co-acting contact surfaces of the series conductor, and means for moving the said conductor to carry its contact surfaces out of the range of the said bending movement of its associated flexible contacts.

6. The combination, in electric actions for organs, of a plurality of series of note sounding devices arranged in branch electric circuits, a flexible contact in the branch circuit of each of the note sounding devices, a series conductor for each of the series of note sounding devices, having contacting surfaces disposed in proximity to said flexible contacts for the respective series, key operated means for selectively bending the flexible contacts of the respective branches against their coacting contact surfaces of the series conductors, and means for selectively moving any of said conductors to carry its contact surfaces out of the range of the said bending movement of its coacting flexible contacts.

7. The combination, in electric actions for organs, of a series of note-sounding devices, an electric circuit provided with branch circuits including a flexible contact for each of said devices, a movable conductor in the circuit arranged in contacting relation to all the said contacts, means for selectively bending the said contacts into contact with the said conductor, and means for moving the said conductor into and out of normal circuit closing relation to the said flexible contacts.

8. The combination, in electric actions for organs, of note-sounding devices for a series of notes, an electric circuit provided with branch circuits for the said devices including a flexible contact for each device, a movable conductor in the circuit arranged in proximity to the said flexible contacts, means for selectively bending the said flexible contacts into contact with the said conductor, and means for moving the said conductor into and out of normal contacting relation to the said flexible contacts.

9. The combination, in electric actions for organs, of note-sounding devices for a musical series of notes, an electric circuit provided with branch circuits for the said de-

vices comprising a flexible contact for each device, a conductor forming a series contact common to all of the said flexible contacts, means for selectively bending any of the
 5 said flexible contacts into contact with the said conductor, and means for moving the contact making portions of the said series contact out of normal contact relation with the said flexible contacts.

10 10. The combination, in electric actions for organs, of note-sounding devices for a plurality of series of notes, an electric circuit provided with branch circuits for the said devices, including an individual flexible
 15 contact for each of said devices, movable contacting conductors, one for each of the said series, means for selectively binding into contact with their respective conductors the individual contacts for the same note in
 20 the several series, and means for selectively moving any of said conductors out of their normal contact-making relation to their respective individual contacts.

11. The combination, in electric actions
 25 for organs, of a plurality of series of note sounding devices arranged in branch electric circuits, a series conductor for each of the series, each conductor being provided with a contact surface for each different
 30 note in its series, the said circuits being provided with a flexible contact for each note, disposed in proximity to the respective contact surfaces of the series conductors, key operated means for selectively
 35 bending the said flexible contacts against the respective contact surfaces of the series conductors, and means for selectively moving any of the said conductors to carry its contact surfaces out of the range of the
 40 said bending movement of its associated flexible contacts.

12. The combination of note-sounding devices for a plurality of musical series of notes, electric branch circuits for controlling
 45 the said devices, including a series contact member for each musical series, common to all the note-sounding devices of that series, an individually movable contact for each note, a series of circuit-closing devices one
 50 for each note common to all the note-sounding devices for that note in each series, and means for selectively moving any of the said series-contact members into and out of contacting relation to its coacting series of in-
 55 dividually movable contacts.

13. The combination, in electric actions for organs, of a note-sounding device, an electric circuit therefor, a movable member provided with an aperture containing coact-
 60 ing circuit-closing contacts of the said circuit, one of the said contacts being appurtenant to the said member and the other contact being flexible and loosely confined in said aperture.

65 14. The combination, in electric actions

for organs, of a note-sounding device, an electric circuit therefor, a movable member provided with an aperture having exposed therein a contact portion of the said circuit, and a flexible wire projecting loosely
 70 through the said aperture, and forming a coacting contact for the said portion.

15. The combination, in electric actions for organs, of a note-sounding device, an electric circuit therefor, a flexible contact
 75 for the said circuit, a movable member having a coacting contact of the said circuit mounted thereon, and having an aperture for confining the said flexible contact in proximity to the said coacting contact.

16. In an electric action for organs, a note-sounding device, an electric circuit therefor, a pair of coacting contacts for opening and closing the said circuit, one of
 80 the said contacts being a free ended flexible wire, means for selectively moving both the said contacts and means for confining the free end of the flexible wire in operative proximity to its coacting contact.

17. The combination, in an electric action
 90 for organs, of a note-sounding device, an electric circuit therefor, coacting contacts including a flexible contact, means for supporting and moving the said contacts and means for loosely encompassing and confin-
 95 ing the said flexible contact in operative proximity to its coacting contact.

18. The combination, in an electric action for organs, of a note-sounding device, an electric circuit therefor, an individually flex-
 100 ible contact in the circuit, a coacting contact in the circuit provided with a draw stop connection, means for loosely confining the flexible contact in proximity to its coacting contact, and a key-operated connection for bending the flexible contact to close the cir-
 105 cuit.

19. The combination, in an electric action for organs, of a note-sounding device, an electric circuit therefor, provided with two
 110 coacting contacts for opening and closing the circuit, one of said contacts being flexible, a key-operated connection for bending the said flexible contact to close the circuit, and means including a draw stop for mov-
 115 ing the other contact out of the range of movement of the said flexible contact.

20. The combination, in an electric action for organs, of an electric circuit provided with branch circuits, note-sounding devices
 120 connected in the said branch circuits, a series of flexible terminals also connected in the branch circuits with the respective note-sounding devices, a common contact for the series of devices, coacting with the said flex-
 125 ible contacts, means for supporting and moving the said common contact, and for loosely confining the respective flexible contacts in coactive proximity to the common contact, and a series of circuit-closing de-
 130

vices for selectively bending the said flexible contacts to close their respective branch circuits through the common contact.

21. The combination, in an electric action
5 for organs, of electric circuits, a musical series of note-sounding devices connected in multiple in the circuits, a corresponding series of flexible contacts for the respective note-sounding devices also connected in multiple in the circuits with the note sounding devices, and a common contact for coacting with the said flexible contacts, means for supporting the said common contact and for separating and loosely confining the respective flexible contacts in coactive proximity to the common contact, and a series of circuit-closing devices for selectively bending the said flexible contacts against the common contact to close the corresponding branch circuits through the said sounding devices, and means for moving the said common contact out of the range of movement of the said flexible contacts.

22. The combination, in an electric action
25 for organs, of a plurality of electric branch circuits, a corresponding plurality of series of note-sounding devices, a series-contact in each branch circuit for its series of note-sounding devices, and a flexible individual contact for each note-sounding device, means for supporting the said series contact and for separating and confining the flexible contacts in coactive relation to their respective series contacts, and a circuit-closing device for bending a plurality of the flexible contacts against their respective series-contacts.

23. The combination, in an electric action
40 for organs, of a series of note-sounding devices, electric circuits for the said series, slider mechanism including a draw stop and provided with a contact common to all the note-sounding devices of the series, and coacting individual contacts for the respective note-sounding devices, the slider being provided with means for electrically separating the said individual contacts and maintaining them in operative proximity to the common contact.

50 24. The combination, in an electric action for organs, of a series of note-sounding devices, electric circuits for the said series, a corresponding series of individual contacts for the respective note-sounding devices, a coacting contact in the circuits common to all the said devices and having its contact portions bent transversely to the general direction of its length, and means for moving said common contact into and out of contacting relation to the said individual contacts.

25. The combination, in an electric action
65 for organs, of a series of note-sounding devices, electric circuits therefor, a row of individual key-operated contacts in the cir-

uits operatively connected with the respective note-sounding devices, a series-contact in the circuit-common to all the said note-sounding devices of the said series, having its contacting portions extending transversely across the said row and between the individual contacts, and means for moving the said common contact into and out of contacting relation to the individual contacts.

26. The combination, in an electric action
75 for organs, of a series of note-sounding devices, electric circuits therefor, including a row of individual contacts for the respective note sounding devices, and a stop slider for the said series, provided with a series-contact common to all the said individual note sounding devices, interlaced back and forth transversely between the said individual contacts.

27. The combination, in an electric action
85 for organs, of a series of note-sounding devices, electric circuits for the said series, including individual contacts for the respective note sounding devices, and a movable member provided with apertures for loosely confining the said individual contacts and having a series-contact common to all the said individual contacts extending transversely from side to side through the said apertures and between the said contacts.

28. The combination, in an electric action
100 for organs, of a series of note-sounding devices, electric circuits therefor, including a series of individual contacts for the respective devices, and a stop slider of insulating material provided with apertures for receiving and loosely confining the said individual contacts, and provided also with a series contact common to all the said individual contacts, the said common contact being laced back and forth from side to side of the said slider and through the said apertures thereof.

29. The combination, in an electric action
110 for organs, of a series of note-sounding devices, electric circuits therefor, including a series of individual contacts for each of said devices, and a series-contact common to all of the said series of devices, means for moving the said series contact into and out of its contacting position, and a spring for yieldingly holding the said series contact in one of its positions, the spring also forming electric connection between the said series contact and the circuit.

30. The combination, in an electric action
125 for organs, of a series of note-sounding devices, electric circuits therefor, including a corresponding series of individual contacts for the respective devices of the series, a slider provided with a series-contact common to all of the said devices, and a spring member electrically connecting the said series contact in the circuit and mechanically hold-

ing the slider yieldingly in one of its positions.

31. The combination, in electric actions for organs, of a plurality of series of note-sounding devices, an electric main circuit having a branch circuit for each of said series, each branch circuit including a series-contact common to all the note-sounding devices of that series, and separate individual contacts for those devices, movable members for separately supporting the respective series contacts of each branch, a spring in each branch mechanically and electrically connected between the series-contact of that branch and the main circuit, and means for selectively moving the said members whereby the series contact of any series may be moved into and out of contacting relation to the individual contacts of its series.
32. The combination, in electric actions for organs, of a plurality of series of note-

sounding devices, an electric main circuit comprising a branch circuit for each of said series of devices each branch being a series contact for the devices in its series, a movable member for each series supporting the said series contact for that series, a spring for each of said movable members mechanically and electrically connecting the series-contact of that member with the main circuit, and means acting in opposition to the respective springs for moving their respective movable members into their electrically operative positions relative to the branch circuits.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN T. AUSTIN.

Witnesses:

JOSEPH MERRITT,
WM. H. HONISS.

Corrections in Letters Patent No. 1,107,127.

It is hereby certified that in Letters Patent No. 1,107,127, granted August 11, 1914, upon the application of John T. Austin, of Hartford, Connecticut, for an improvement in "Electric Actions for Organs," errors appear in the printed specification requiring correction as follows: Page 4, line 17, for the word "binding" read *bending*; same page, line 95, for the word "incompassing" read *encompassing*; page 5, line 68, for the compound word "circuit-common" read *circuits common*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 20th day of October, A. D., 1914.

[SEAL.]

J. T. NEWTON,

Acting Commissioner of Patents.