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K. F. VON BASSUS.

HARMONIUM.

No. 589,066. Patented Aug. 31, 1897.

Fig. 1.

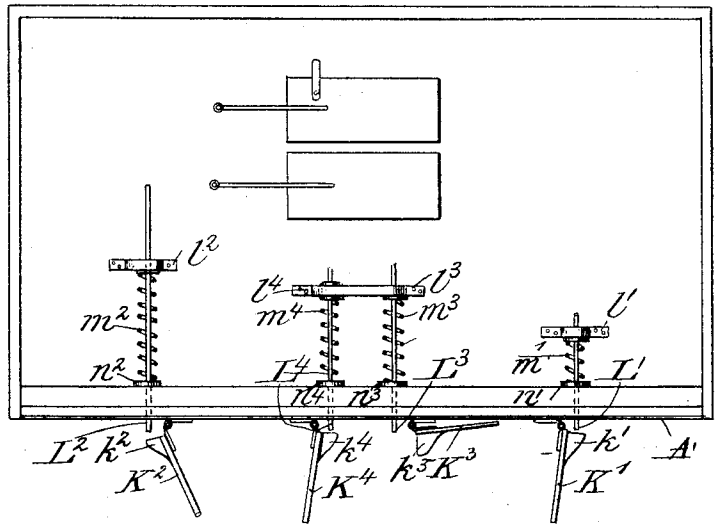


Fig. 3.

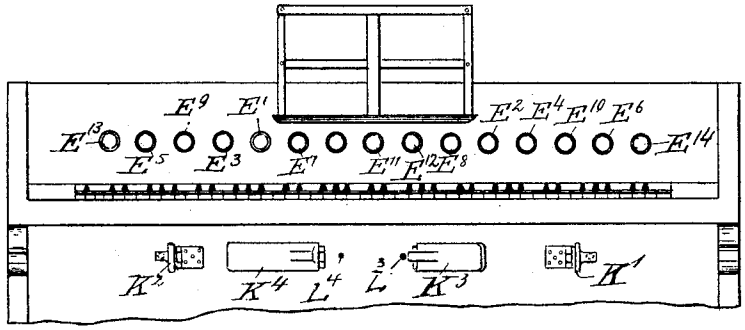
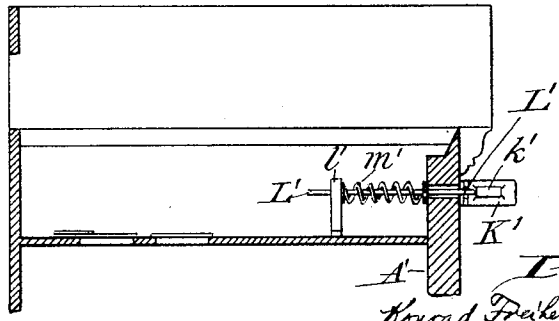


Fig. 2.



Witnesses:
M. G. Steamey.
M. C. Massie.

Inventor:
Konrad Freiherr von Bassus
by Max Stengel
Attorney.

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Fig. 4.

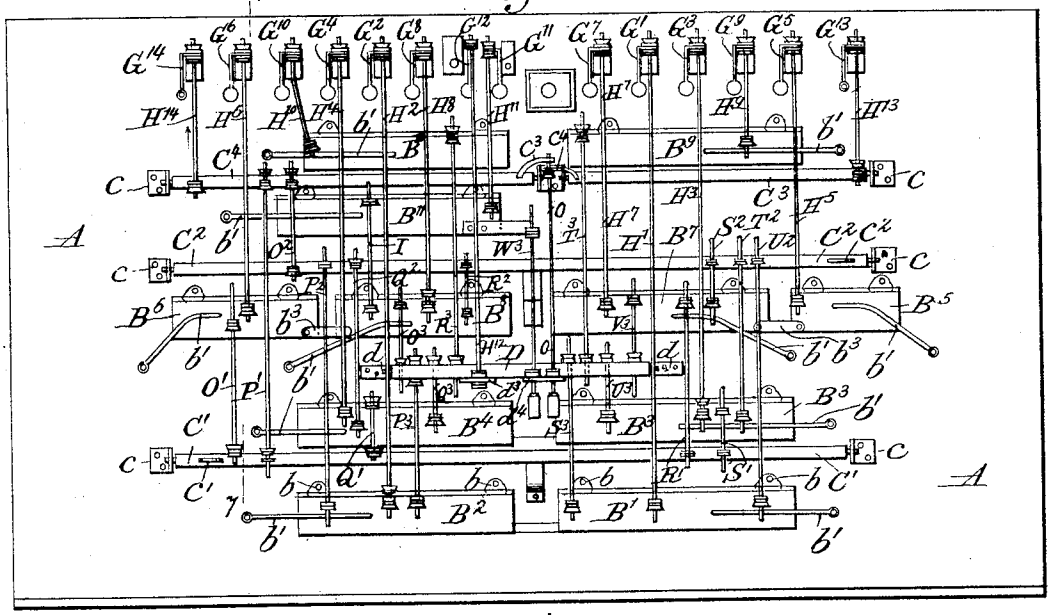


Fig. 5.

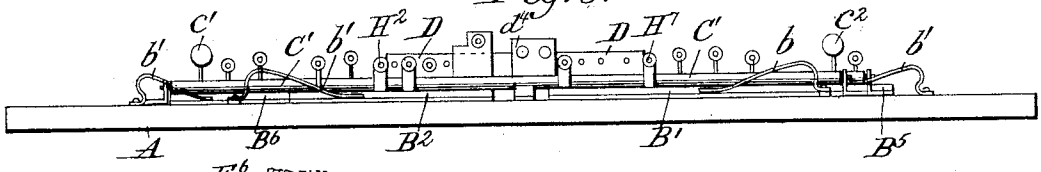


Fig. 6.

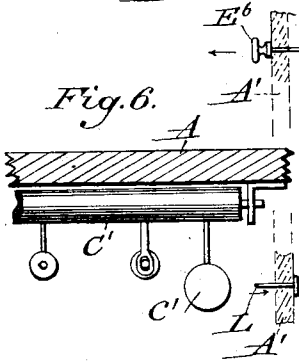


Fig. 7.

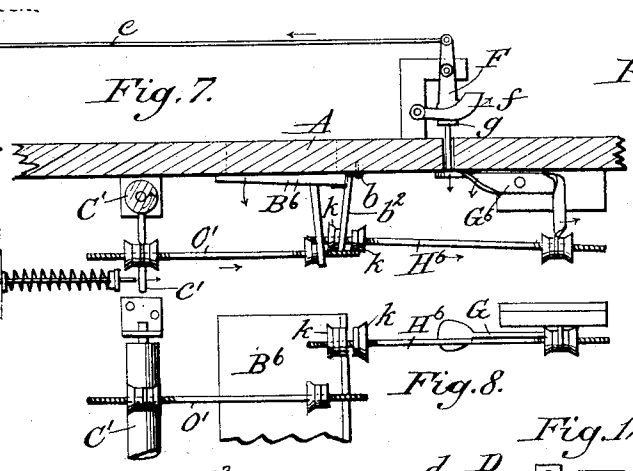


Fig. 9.

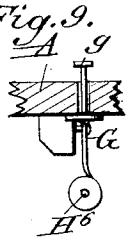


Fig. 8.

Fig. 11.

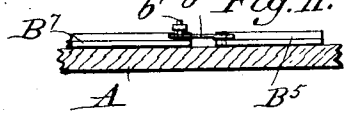
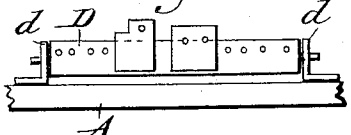


Fig. 12.



Attest:

F. H. Schott

M. C. Massie.

Inventor

Conrad F. von Bassus

by Mason Fenwick & Lawrence

Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

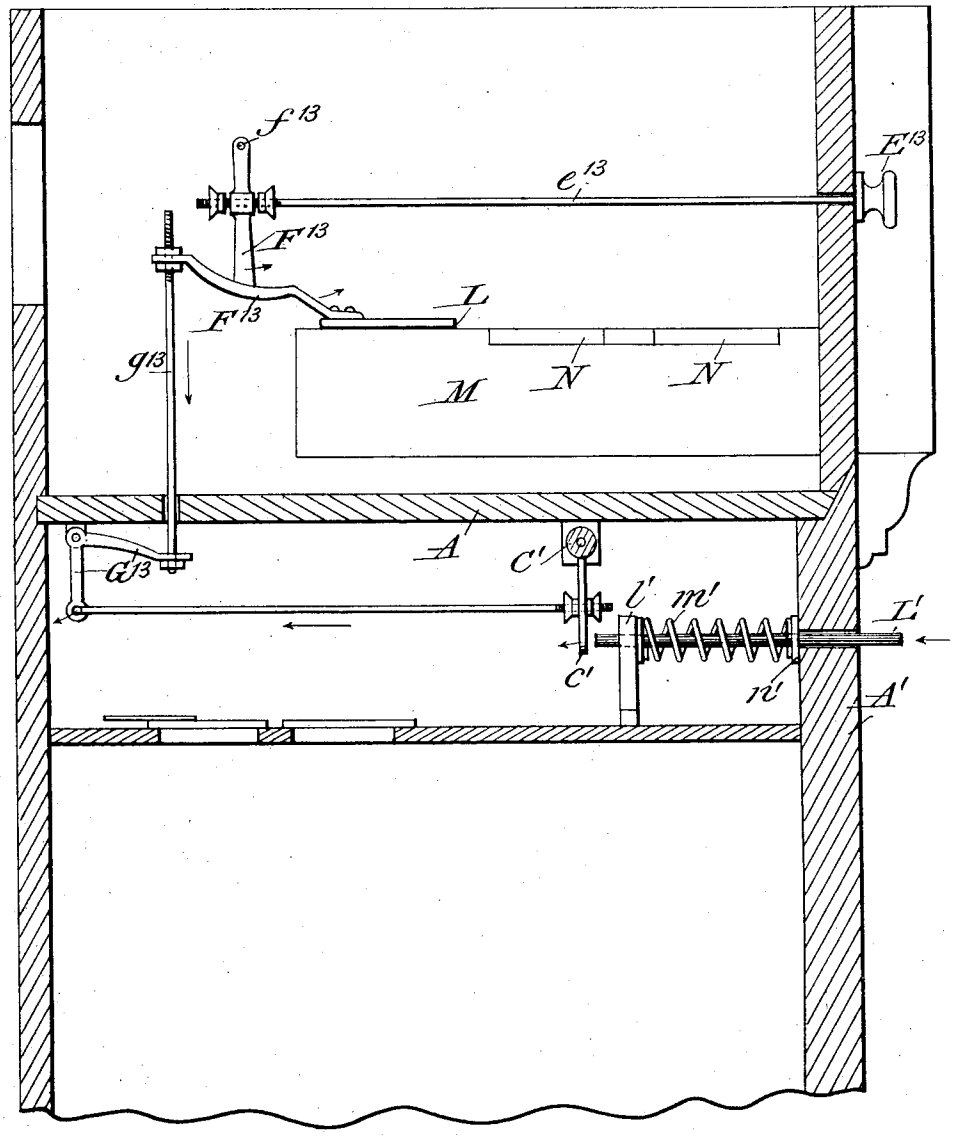
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K. F. VON BASSUS.

HARMONIUM.

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Fig. 10.



Attest:
F. H. Schott
M. C. Massie.

Inventor:
Conrad F. v. Bassus
by Mast Foos & Co
Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

KONRAD FRH. VON BASSUS, OF MUNICH, GERMANY.

HARMONIUM.

SPECIFICATION forming part of Letters Patent No. 589,066, dated August 31, 1897.

Application filed March 21, 1896. Serial No. 584,320. (No model.) Patented in Germany March 24, 1895, No. 84,497.

To all whom it may concern.

Be it known that I, KONRAD FRH. VON BASSUS, a citizen of the Empire of Germany, residing at Munich, Bavaria, Germany, have invented certain new and useful Improvements in Harmoniums, (patented in Germany March 24, 1895, No. 84,497,) of which the following is a specification.

My invention relates to an improvement in harmoniums or organs, and particularly to a combination stop-action for such instruments and means for operating such an action.

The main object of my invention is to provide means whereby the performer may change the timbre or strength of the tone, or both, simultaneously without the necessity of removing the hands from the keys.

The invention consists in the features, details of construction, and combination of parts, which will first be described in connection with the accompanying drawings, and then particularly pointed out in the claims.

In the drawings, Figure 1 is a horizontal sectional view of a harmonium, taken just below the diaphragm and illustrating one embodiment of my invention; Fig. 2, a detail transverse sectional view with the diaphragm and its attached parts removed; Fig. 3, a detail front elevation; Fig. 4, a bottom plan view of the diaphragm, showing the stop-actions in place thereon; Fig. 5, a view at right angles to Fig. 4; Figs. 6 to 9, detail views to be referred to hereinafter, and Fig. 10 a detail transverse sectional view showing a part of the action in side elevation. Fig. 11 is a detail view showing the manner of connecting the flaps B^6 B^8 and B^5 B^7. Fig. 12 is a shortened detail view of the apron D.

Referring to the drawings, A is a diaphragm secured in the casing A′ of the harmonium and serving to support the action which is located on the under side of the same. This action in the present case comprises the following construction:

To the under side of the diaphragm A are hinged at *b*, Fig. 4, a series of flaps or valves B′ to B^{11}, inclusive, which serve to control the supply of air under pressure to the various sets of reeds, these flaps being placed over openings in the diaphragm A.

To the under side of the diaphragm A and at suitable points between the various flaps B are placed shafts C′, C^2, C^3, and C^4, provided with gudgeons, which are rotatable in lugs or ears *c*, secured to the under side of the diaphragm, the shafts C^3 and C^4 having their axes in line with each other. The shafts C′ and C^2 are each provided with an arm or target c' c^2, for a purpose hereinafter described, these arms or targets being in the present instance located at opposite ends of their respective shafts, as shown in Fig. 4, and preferably project downward. The diaphragm A also carries a pivotally-mounted apron or small board D, provided with gudgeons mounted rotatably in lugs *d*, projecting downward from the under side of the diaphragm.

The stop mechanism comprises a series of pulls or stops, which I have indicated by the reference-letter E, Figs. 3 and 10, with exponents corresponding to those of the reference-letter B applied to the flaps or valves, in order that the connections between each pull or stop and its valve may be readily traced. For brevity, however, the reference-letters will be used without the exponents as referring to all the parts of a kind.

Each stop E is connected by a wire *e* to a lever F, provided with a cam-shoe *f*, which bears against the cap of a stud *g*, passing through a hole in the diaphragm and connected to or formed integral with a bell-crank G, pivoted on the under side of the diaphragm, as shown in Fig. 7. These bell-cranks G are connected to their corresponding flaps by wires H, the exponents of the reference-letters G, H, and B indicating the respective connected parts. For instance, the wire H′ connects the bell-crank G′ and the flap B′, the wire H^2 the bell-crank G^2 and the flap B^2, and so on.

By the construction described the flaps or valves may be individually opened by drawing out their respective stops or pulls E, each stop or pull when thus drawn out being held against accidental inward movement by the friction between the respective cam-shoe *f* and the cap of the corresponding stud *g*, the flaps being each provided with a leaf-spring *b*′, whereby when the respective stops are pushed in the flaps or valves will be closed by said springs.

In order to permit the flaps or valves to be actuated by mechanism aside from that just described and which will be explained hereinafter, the wires H are attached to their respective flaps in a manner to permit a certain amount of lost motion in the direction of opening the flaps. This is done, preferably, as follows: Each flap is provided with an ear b^2, having an opening through which its corresponding wire H passes freely, said wire being provided with a nut or nuts k at one side or at each side of said ear, the nut on that side of the ear farthest removed from the respective bell-crank G being located in close contact with said ear, whereas the nut, if any, on the other side of the ear is slightly removed therefrom, whereby, if the flap be opened by means independent of its individual pull-wire, it will be free to move without its ear actuating the said wire.

The flaps B^5 and B^7, B^6 and B^8, it will be noticed, are connected by arms b^3, each arm being fixed to one of the outer flaps and provided with a hole at the other end, through which passes loosely a stud b^4, secured to the corresponding adjacent flap, and provided at its free end with a cap arranged out of contact with its arm when the flaps are in their closed position. By this construction each flap of the two pairs B^5 and B^7, B^6 and B^8 is capable of a limited amount of movement independent of the adjacent flap to which it is connected, while at the same time by opening each flap to a considerable extent the adjacent flap to which it is connected will also be opened to an extent sufficient to allow the air to pass through its opening, thereby permitting two sets of reeds to sound simultaneously by drawing out either one of the two stops to the necessary extent.

In addition to the above-mentioned connection between the flaps B^6 and B^8 the latter flap is also connected to the flap B^{11} by a wire I, so attached to said flaps as to permit a slight amount of lost motion in the same way as described with relation to the manner of attaching the wires H to their respective flaps, whereby when the flap B^{11} is opened, by pulling out its respective pull or stop E^{11} to the full extent, it will also open the flaps B^8 and B^6, thus permitting three sets of reeds to sound simultaneously.

K', K^2, K^3, and K^4 are knee-levers movably connected to the front of the harmonium or organ casing A', preferably by hinging, as shown in Figs. 1 and 3, said knee-levers being in pairs, the members of each pair being arranged to move toward and from each other. On that side of each lever away from the corresponding lever of its own pair is an arm, lug, or projection k' k^4, extending approximately at right angles to its respective knee-lever, the said arms, lugs, or projections being arranged to contact with the outward-projecting ends of stickers L' L^2 L^3 L^4. Each sticker is adapted to move longitudinally, being guided in openings in the casing A' and in a block or support l' l^2 l^3 l^4, secured to any suitable fixed part of the instrument. Each sticker, moreover, is normally held outward by a spring device—such, for instance, as the coiled springs m' m^2 m^3 m^4—surrounding the stickers, as shown in Fig. 1, each spring bearing against a collar n' n^4, fixed on the respective sticker and also against the block l' l^4. By this construction each knee-lever is pressed toward the opposite knee-lever of the pair to which it belongs and to such an extent that it will normally stand approximately at right angles to the front of the instrument, but may be swung toward the opposite member of its pair until it is flat against the front of the instrument, one knee-lever K^3 being shown in this closed position in Fig. 1.

The sticker L' is located so that its inner end is opposite and in comparatively close proximity to the target c', whereby when the said sticker is forced inward the said end contacts with the said target and then partly rotates the shaft c'. This shaft is connected by the wires O', P', Q', R', and S' to the flap B^6, the shaft C^4, and the flaps B^4, B^7, and B^3, respectively.

The sticker L^2 in a similar manner operates the shaft C^2, the latter being connected by wires O^2, P^2, Q^2, R^2, S^2, T^2, and U^2 to the shaft C^4 and to the flaps B^2, B^4, B^8, B^7, B^3, and B', respectively.

The sticker L^3 is arranged to contact with a target d^3, secured to the apron D, while the sticker L^4 is also arranged to contact with a target d^4 on the apron, whereby said apron is given a partial rotation, this apron being connected by wires O^3 P^3 Q^3 R^3 V^3 to the flaps B^8 B^2 B^4 B^{10} B' B^9 B^3 B^7, respectively. In addition the said apron is also connected by a wire or rod O to two arms c^3 c^4 on the ends of the shafts C^3 C^4, respectively, and, moreover, is connected by a rod or wire H^{12} with a bell-crank G^{12}, operated from the stop E^{12} in the same manner as the bell-cranks G' to G^{11}, previously described. Furthermore, the apron D is connected by a rod or wire W^3 to the flap B^{11}.

The two rods C^3 C^4 are each connected by wires H^{13} H^{14} with bell-crank levers G^{13} G^{14}, respectively. As these levers are intended to be used for operating the dampers for the base and treble, the construction intervening between them and their individual stops E^{13} E^{14} is somewhat modified. This construction will now be described in connection with the treble-forte mechanism, that for the base being the same.

Referring to Fig. 10 of the drawings, it will be seen that the bell-crank G^{13} is connected by a vertical wire g^{13} to one arm of a swinging lever F^{13}, fulcrumed at f^{13} and carrying the damper L, which normally rests on the top of the chest M, in which the tongues or reeds N are located, whereby the sound is damped. By the movement of the bell-crank G^{13} the lever F^{13} is swung on its pivot and the damper L lifted, thus accomplishing the forte

expression on the treble of the instrument. To the lever F^{13} is also connected a pull-wire e^{13}, which connects said lever to the stop E^{13}. By these various connections, as above described, the flaps may be opened singly or in various combinations and the dampers raised at the time when either one set of reeds or various sets of reeds are being used. Moreover, by using the knee-levers various combinations of stops may be made.

The most important feature of the mechanism thus described is the construction and arrangement of the knee-levers in such a manner that the knees of the performer may be inserted each between the two members of one pair of levers and a change can be made from one combination of stops to another without any break in the music and without taking the hands from the keys by merely moving the knee or knees from one side to the other—that is, from the right to the left, or vice versa.

By the employment of two pairs of knee-levers a still greater advantage arises from the fact that a new mode of operation may be introduced—that is, each lever of a pair may be operated to throw a combination in action at the time one of the opposite knee-levers is being used to throw another combination into action, thus producing still a new combination of reeds.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an organ or similar instrument the combination, with a stop-action, of a pair of knee-levers so placed as to admit the knee of the performer between its constituent members, and mechanism connected to the parts of the stop-action and arranged to be actuated by the knee-levers, the operating movement of one lever of the pair being in a direction opposite to that of the operating movement of the other lever of the same pair, substantially as described.

2. In an organ or similar instrument, the combination, with a stop-action, of two pairs of knee-levers, each pair being so placed as to admit the knee of the performer between its constituent members, and mechanism connected to the parts of the stop-action and arranged to be actuated by the knee-levers, the operating movement of one lever of each pair being in a direction opposite to that of the operating movement of the other lever of the same pair, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

KONRAD FRH. VON BASSUS.

Witnesses:
ALBERT WEICKMANN,
KARL MAYER.