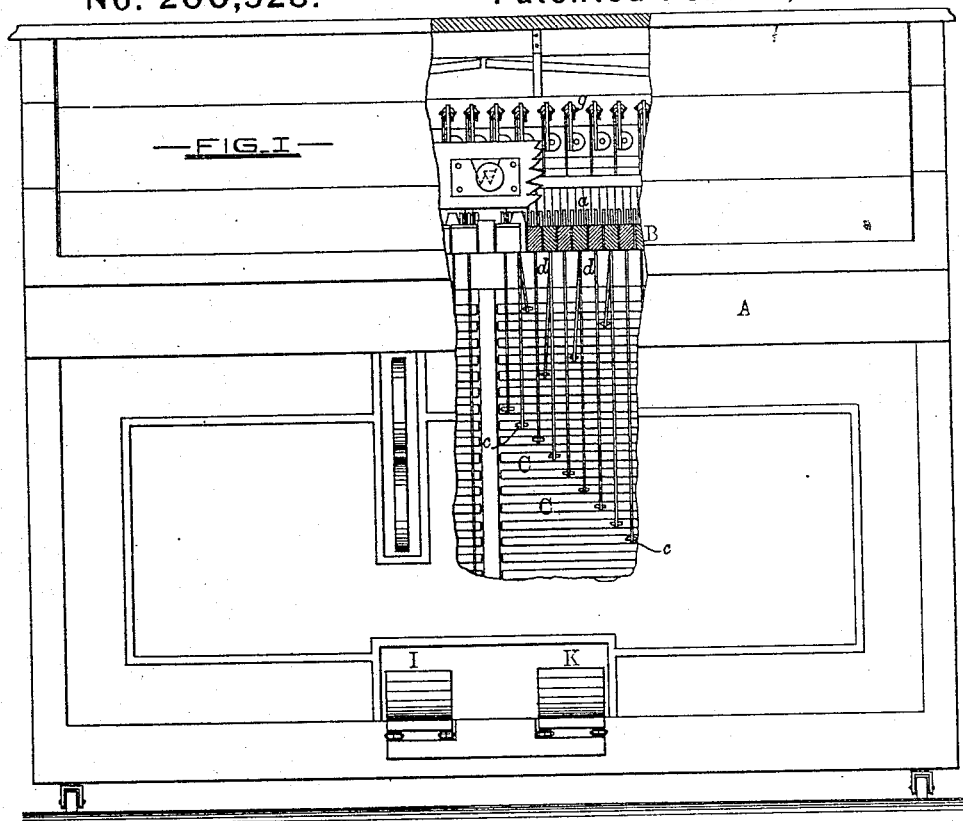
2 Sheets—Sheet 1.

H. F. GRAETZEL.

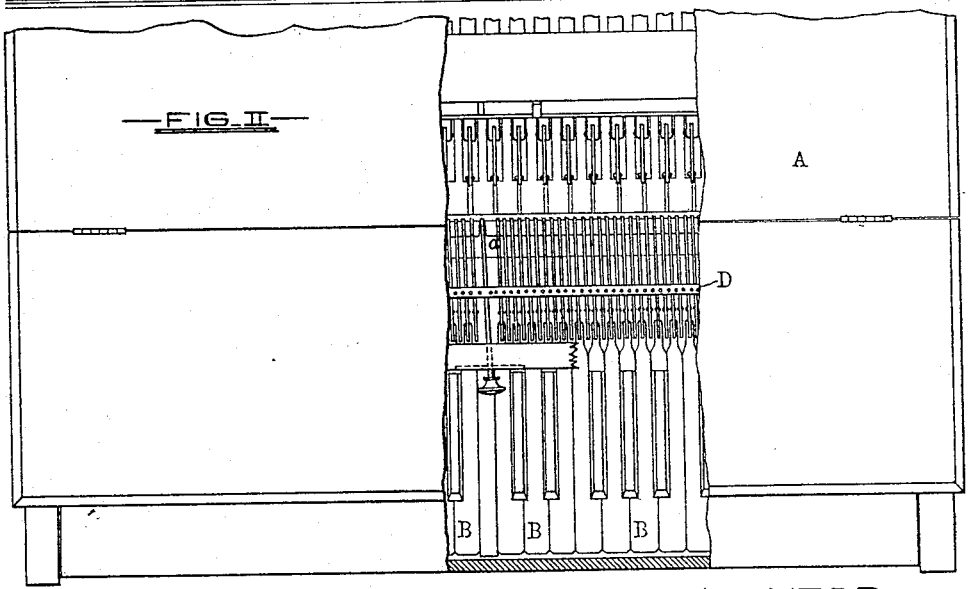
Reed-Organs.

No. 200,528. Patented Feb. 19, 1878.

—FIG. I—



—FIG. II—



—WITNESSES—

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atty

2 Sheets—Sheet 2.

H. F. GRAETZEL

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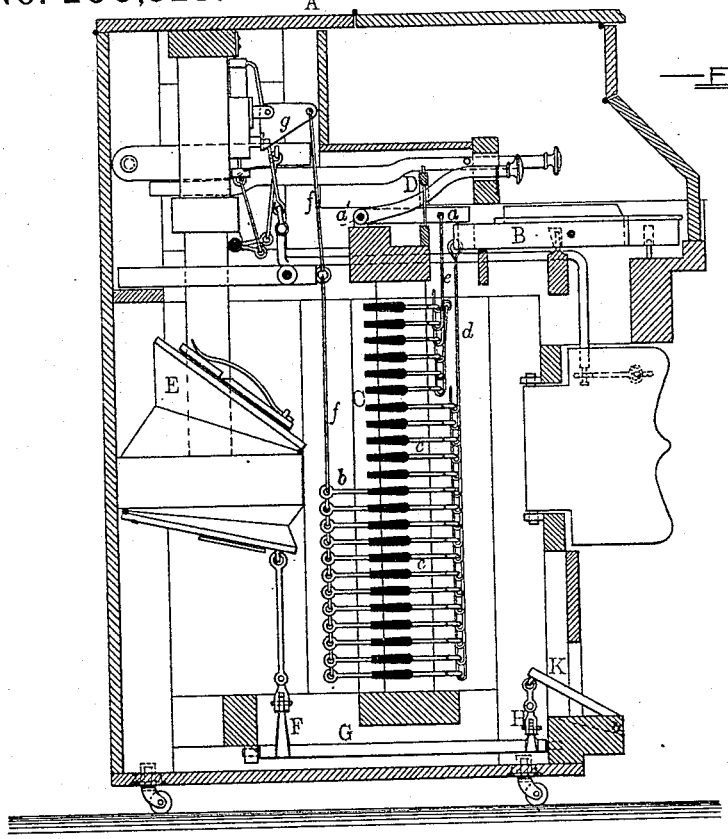
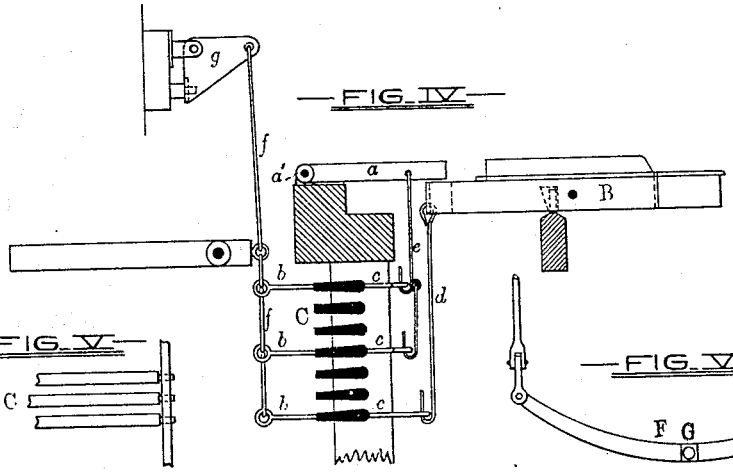
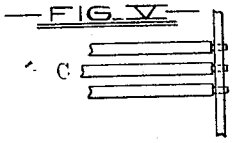
—FIG. III—



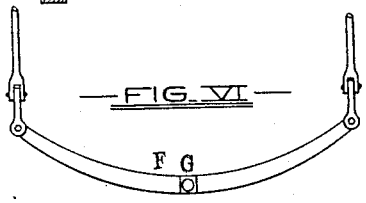
—FIG. IV—



—FIG. V—



—FIG. VI—



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UNITED STATES PATENT OFFICE.

HENRY F. GRAETZEL, OF GARDENVILLE, MARYLAND.

IMPROVEMENT IN REED-ORGANS.

Specification forming part of Letters Patent No. **200,528**, dated February 19, 1878; application filed June 25, 1877.

To all whom it may concern:

Be it known that I, HENRY F. GRAETZEL, of Gardenville, in the county of Baltimore and State of Maryland, have invented certain Improvements in Reed-Organs, of which the follow is a specification; and do hereby declare that in the same is contained a full, clear, and exact description of my said invention, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

The first part of my invention has reference to a method of combining the mechanism operating directly upon the reed-valves to open and close them with the keys of the key-board, whereby the melody and harmony are sounded or played by the depression with the finger of a single key.

The object of this part of the said invention is to so simplify the mechanical operations in musical performances upon the reed-organ that persons possessed of only a limited or rudimentary musical knowledge may be able to properly perform musical compositions, which, under other circumstances, they would be unable to render in a satisfactory manner.

The second part of the said invention has reference to the means for transposing the scale, or of changing the key or pitch in which the air is played.

The third part of the invention refers to certain improvements in the treadle mechanism for inflating the bellows of the organ.

In the drawing forming a part hereof, Figure 1 is a partially sectional front view of the improved organ. Fig. 2 is a plan of the invention, also partly in section. Fig. 3 is a transverse section of the same. Figs. 4, 5, and 6 are views of parts of the invention on an enlarged scale.

Similar letters of reference indicate similar parts in all the figures.

A represents the frame of the organ, which in general appearance and construction differs little from those of organs commonly in use. The organ is provided with reeds, reed-valves, and a key-board of ordinary description, and stops to vary the volume of sound. These parts, however, form no portion of the present improvement, and are but imperfectly shown in the drawing.

The mechanism connecting the keys of the key-board with the reed-valve operating mechanism consists as follows: A series of levers, *a*, are pivoted to a bar, *a'*, extending longitudinally of the organ and immediately in the rear of the key-board, the keys of which are represented by B. The free ends of the levers *a* occupy such position with reference to the keys B as to admit of certain of them being elevated as the outer ends of the keys are depressed.

By reference to the drawing it will be seen that the operative levers, or those adapted to be elevated by the keys, as described, constitute one half of the entire number of the levers, the other half of the same being inoperative. This arrangement of the levers and keys may, however, be reversed and the inoperative levers rendered operative by moving the free ends of the levers longitudinally of the instrument a distance equal to one-half the distance between the centers of the keys. The operative levers in all cases sound the note forming the harmony, the melody being sounded directly from the inner ends of the keys.

C C are lever-plates, arranged one above the other in a vertical line, and pivoted or hinged to a part of the frame A. Each one of the lever-plates is provided with a stud, *b*, projecting from its rear edge, and with a series of studs, *c c*, extending from its front edge.

Motion is communicated from the inner ends of the keys to the studs *c* on the front edges of the lever-plates in two ways—by wires *d* leading from the said inner ends of the keys, and by wires *e* leading from the levers *a*. The hooks on the wires *d e* are open at their upper ends to admit of the movement of the lever-plates independently of all the said wires, except those used to give them motion. The studs *b* on the rear edges of the lever-plates are also provided with wires *f*, which wires connect the said studs with bell-cranks *g*, operating the reed-valves, which are not shown in the drawing.

Upon the depression of a certain key motion is communicated directly to a lever-plate having a rear stud, which operates a reed, the sound of which is the melody. One note of the harmony is sounded from the lever *a*, which is elevated by the said key, and the other notes of the same by means of the wire *d* and

by additional wires connected thereto. From this description it will be seen that to play the melody and harmony the depression of a single key only is necessary.

To transpose the scale, or to change the pitch, the inoperative levers *a* are rendered operative by sliding them from between the inner ends of the keys to a position directly over them. The said levers are moved collectively by means of a barred frame, D, fitted to slide longitudinally of the case, and which is furnished with a handle within convenient reach of the operator.

The bellows E of the organ are provided with two hinged doors at their under side, each one of which is attached, by means of a rod, to one end of a cross-lever, F, forming a part of the rocking shaft G. The front end of the rocking shaft is furnished with another cross-lever, H, to the ends of which are connected, by links or rods, the foot-boards I K. By means of this arrangement of the bellows-operating mechanism, the two foot-boards act reciprocally, the depression of one board causing the elevation of the other; and the springs ordinarily used to cause the recovery of the foot-boards are thus rendered unnecessary.

Having thus described my invention, what I claim as new, and wish to secure by Letters Patent of the United States, is—

1. The series of levers *a*, bar *a'*, wires *e*, lever-plates C, wires *f*, and bell-cranks *g*, combined with the keys B and wires *d*, substantially as and for the purposes specified.

2. The combination of the series of levers *a*, bar *a'*, and keys B with the sliding barred frame D, substantially as and for the purposes described.

3. In combination with the bellows E, the rocking shaft G, having secured thereto two cross-levers, one of the said levers being attached by means of rods or similar devices to the hinged doors of the bellows, and the other lever connected by rods or links to the foot-boards I K, substantially as and for the purpose herein specified.

In testimony whereof I have hereunto subscribed my name this 23d day of May, in the year of our Lord 1877.

HENRY F. GRAETZEL.

Witnesses:
WM. W. TOWSON,
THOMAS MURDOCH.